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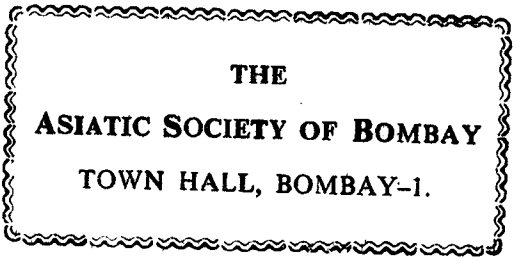
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Royal Commission on Agriculture in India.

VOLUME IV.

Evidence taken in Bengal.

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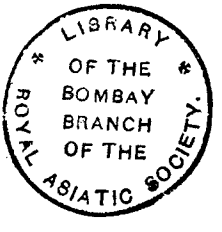

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ROYAL COMMISSION ON
AGRICULTURE IN INDIA.

Fourth Interim Report of the Royal Commission on Agriculture in India.

June, 1927.

Presented to Parliament by
Command of His Majesty.
August, 1927.

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1927
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INTERIM REPORT.

To

THE KING'S MOST EXCELLENT MAJESTY.

May It Please Your Majesty,

We, the Commissioners appointed to examine and report on the present conditions of agricultural and rural economy in British India, and to make recommendations for the improvement of agriculture and to promote the welfare and prosperity of the rural population; in particular, to investigate:—(*a*) the measures now being taken for the promotion of agricultural and veterinary research, experiment, demonstration and education, for the compilation of agricultural statistics, for the introduction of new and better crops and for improvement in agricultural practice, dairy farming and the breeding of stock; (*b*) the existing methods of transport and marketing of agricultural produce and stock; (*c*) the methods by which agricultural operations are financed and credit afforded to agriculturists; (*d*) the main factors affecting rural prosperity and the welfare of the agricultural population; and to make recommendations; availing ourselves of Your Majesty's permission to report our proceedings from time to time, desire to submit to Your Majesty the minutes of evidence which we have taken up to the 7th January, 1927, on the subject of our Inquiry.

All of which we most humbly submit for Your Majesty's most gracious consideration.

(Signed) LINLITHGOW,
Chairman.
(„) H. S. LAWRENCE.
(„) T. H. MIDDLETON.
(„) J. MACKENNA.
(„) H. CALVERT.
(„) N. GANGULEE.
(„) L. K. HYDER.
(„) B. S. KAMAT.

(Signed) J. A. MADAN,
(„) F. W. H. SMITH,
Joint Secretaries.

7th June, 1927.

(63311—22) Wt. 8648—651 625 8/27 H. St. G. 71

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TERMS OF REFERENCE

Generally,

To examine and report on the present conditions of agriculture and rural economy in British India and to make recommendations for the improvement of agriculture and the promotion of the welfare and prosperity of the rural population;

In particular to investigate—

(*a*) the measures now being taken for the promotion of agricultural and veterinary research, experiment, demonstration and education, for the compilation of agricultural statistics, for the introduction of new and better crops and for improvement in agricultural practice, dairy farming and the breeding of stock;

(*b*) the existing methods of transport and marketing of agricultural produce and stock;

(*c*) the methods by which agricultural operations are financed and credit afforded to agriculturists;

(*d*) the main factors affecting rural prosperity and the welfare of the agricultural population;

and to make recommendations.

It will not be within the scope of the Commission's duties to make recommendations regarding the existing system of landownership and tenancy or of the assessment of land revenue and irrigation charges, or the existing division of functions between the Government of India and the local Governments. But the Commission shall be at liberty to suggest means whereby the activities of the Governments in India may best be co-ordinated and to indicate directions in which the Government of India may usefully supplement the activities of local Governments.

QUESTIONNAIRE

Part I

Question.

1. Research.
2. Agricultural Education.
3. Demonstration and Propaganda.
4. Administration.
5. Finance.
6. Agricultural Indebtedness.
7. Fragmentation of Holdings.

Part II

8. Irrigation.
9. Soils.
10. Fertilisers.
11. Crops.
12. Cultivation.
13. Crop Protection.
14. Implements.

Part III

15. Veterinary.
16. Animal Husbandry.

Part IV

17. Agricultural Industries.
18. Agricultural Labour.
19. Forests.
20. Marketing.
21. Tariffs and Sea Freights.
22. Co-operation.
23. General Education.
24. Attracting Capital.
25. Welfare of Rural Population.
26. Statistics.

QUESTIONNAIRE

PART I

1. Research.

(*a*) Have you suggestions to advance for the better organisation, administration and financing of—

(*i*) All research affecting the welfare of the agriculturist, including research into the scientific value of the indigenous theory and traditional methods of agriculture,

(*ii*) Veterinary research ?

(*b*) If in cases known to you progress is not being made because of the want of skilled workers, or field or laboratory facilities for study or by reason of any other handicaps, please give particulars. [Suggestions of a general kind should be made under (*a*) ; answers under this heading should relate to specific subjects. The purpose is to secure a list of the problems met with by scientific investigators in the course of their work which are being held over because of lack of resources or deficient organisation.]

(*c*) Can you suggest any particular subject for research not at present being investigated to which attention might usefully be turned ?

2. Agricultural Education.

With reference to any form of agricultural education of which you may have experience, please state your views on the following :—

(*i*) Is the supply of teachers and institutions sufficient ?

(*ii*) Is there an urgent need for extension of teaching facilities in any district or districts known to you personally ?

(*iii*) Should teachers in rural areas be drawn from the agricultural classes ?

(*iv*) Are the attendances at existing institutions as numerous as you would expect in present circumstances ; if not, state reasons. Can you suggest measures likely to stimulate the demand for instruction ?

(*v*) What are the main incentives which induce lads to study agriculture ?

(*vi*) Are pupils mainly drawn from the agricultural classes ?

(*vii*) Are there any modifications in existing courses of study which appear to be called for ; if so, what are they ?

(*viii*) What are your views upon (*a*) nature study ; (*b*) school plots ; (*c*) school farms ?

(*ix*) What are the careers of the majority of students who have studied agriculture ?

(*x*) How can agriculture be made attractive to middle class youths ?

(*xi*) Are there recent movements for improving the technical knowledge of students who have studied agriculture ?

(*xii*) How can adult education in rural tracts be popularised ?

(*xiii*) In suggesting any scheme for better educational facilities in rural areas, please give your views for (*a*) its administration and (*b*) its finance.

3. Demonstration and Propaganda.

(*a*) What are the measures which in your view have been successful in influencing and improving the practice of cultivators ?

(*b*) Can you make suggestions for increasing the effectiveness of field demonstrations ?

(*c*) Can you suggest methods whereby cultivators may be induced to adopt expert advice ?

(*d*) If you are aware of any striking instances of the success or the failure of demonstration and propaganda work, please give particulars and indicate the reasons for success or for failure.

4. Administration.

(*a*) Do you wish to suggest means towards the better co-ordination of the activities of the Governments in India or to indicate directions in which the Government of India may usefully supplement the activities of the local Governments ?

(*b*) Is it your opinion that the expert scientific knowledge required in the development of agriculture in the different Provinces could be supplied to a greater extent than is the case at present by increasing the scientific staff of the Government of India ? If so, indicate the types of work which would benefit by pooling the services of experts, and suggest how that work should be controlled.

(*c*) Are you satisfied from the agricultural standpoint with the services afforded by—

(*i*) The Agricultural and Veterinary Services,

(*ii*) Railways and steamers,

(*iii*) Roads,

(*iv*) Meteorological Department,

(*v*) Posts, and

(*vi*) Telegraphs, including wireless ?

If not, please indicate directions in which you think these Services might be improved or extended.

5. Finance.

(*a*) What are your views as to the steps that should be taken for the better financing of agricultural operations and for the provision of short and long-term credit to cultivators ?

(*b*) Do you wish to suggest means whereby cultivators may be induced to make fuller use of the Government system of *taccavi* ?

6. Agricultural Indebtedness.

(*a*) What in your opinion are :—

(*i*) the main causes of borrowing,

(*ii*) the sources of credit, and

(*iii*) the reasons preventing repayment.

(*b*) What measures in your opinion are necessary for lightening agriculture's burden of debt ? For example, should special measures be taken to deal with rural insolvency, to enforce the application of the Usurious Loans Act, or to facilitate the redemption of mortgages ?

(*c*) Should measures be taken to restrict or control the credit of cultivators such as limiting the right of mortgage and sale ? Should non-terminable mortgages be prohibited ?

7. Fragmentation of Holdings.

(*a*) Do you wish to suggest means for reducing the loss in agricultural efficiency attendant upon the excessive subdivision of holdings ?

(*b*) What are the obstacles in the way of consolidation and how can they be overcome ?

(*c*) Do you consider legislation to be necessary to deal with minors, widows with life interest, persons legally incapable, alienation and dissentients, and to keep disputes out of the courts ?

PART II

8. Irrigation.

(*a*) Name any district or districts in which you advocate the adoption of new irrigation schemes, or suggest extensions or improvements in the existing systems or methods of irrigation by—

(*i*) Perennial and non-perennial canals,
(*ii*) Tanks and ponds,
(*iii*) Wells.

What are the obstacles in your district or Province to the extension of irrigation by each of the above methods ?

(*b*) Are you satisfied with the existing methods of distributing canal water to cultivators ? Describe the methods that have been employed to prevent wastage of water by evaporation and by absorption in the soil. What form of outlet for distribution to cultivators at the tail end do you regard as the most equitable and economical ? Have these methods and devices been successful, or do you wish to suggest improvements ?

(*N.B.*—Irrigation charges are *not* within the terms of reference of the Commission, and should not be commented upon.)

9. Soils.

(*a*) Have you suggestions to make—

(*i*) for the improvement of soils, whether by drainage or other means, not dealt with under other headings in this questionnaire.
(*ii*) for the reclamation of Alkali (Usar) or other uncultivable land,
(*iii*) for the prevention of the erosion of the surface soil by flood water ?

(*b*) Can you give instances of soils known to you which, within your recollection, have—

(*i*) undergone marked improvement,
(*ii*) suffered marked deterioration ?

If so, please give full particulars.

(*c*) What measures should Government take to encourage the reclamation of areas of cultivable land which have gone out of cultivation ?

10. Fertilisers.

(*a*) In your opinion, could greater use be profitably made of natural manures or artificial fertilisers ? If so, please indicate the directions in which you think improvement possible.

(*b*) Can you suggest measures to prevent the fraudulent adulteration of fertilisers ?

(*c*) What methods would you employ to popularise new and improved fertilisers ?

(*d*) Mention any localities known to you in which a considerable increase in the use of manures has recently taken place.

(*e*) Has effect of manuring with phosphates, nitrates, sulphate of ammonia, and potash manures been sufficiently investigated ? If so, what is the result of such investigation ?

(*f*) What methods would you employ to discourage the practice of using cowdung as fuel ?

11. Crops.

(*a*) Please give your views on—

(*i*) the improvement of existing crops,

(*ii*) the introduction of new crops including fodder crops,

(*iii*) the distribution of seeds,

(*iv*) the prevention of damage by wild animals.

(*b*) Can you suggest any heavy yielding food crops in replacement of the present crops ?

(*c*) Any successful efforts in improving crops or substituting more profitable crops which have come under your own observation should be mentioned.

12. Cultivation.

Can you suggest improvements in—

(*i*) the existing system of tillage, or

(*ii*) the customary rotations or mixtures of the more important crops ?

13. Crop Protection, Internal and External.

Please give your views on—

(*i*) The efficacy and sufficiency of existing measures for protection of crops from external infection, pests and diseases.

(*ii*) The desirability of adopting internal measures against infection.

14. Implements.

(*a*) Have you any suggestion for the improvement of existing, or the introduction of new, agricultural implements and machinery ?

(*b*) What steps do you think may usefully be taken to hasten the adoption by the cultivator of improved implements ?

(*c*) Are there any difficulties which manufacturers have to contend with in the production of agricultural implements or their distribution for sale throughout the country ? If so, can you suggest means by which these difficulties may be removed ?

PART III

15. Veterinary.

(*a*) Should the Civil Veterinary Department be under the Director of Agriculture or should it be independent ?

(*b*) (*i*) Are dispensaries under the control of Local (District) Boards ? Does this system work well ?

(*ii*) Is the need for expansion being adequately met ?

(*iii*) Would you advocate the transfer of control to Provincial authority ?

(*c*) (*i*) Do agriculturists make full use of the veterinary dispensaries ? If not, can you suggest improvements to remedy this ?

(*ii*) Is full use made of touring dispensaries ?

(*d*) What are the obstacles met with in dealing with contagious diseases ? Do you advocate legislation dealing with notification, segregation, disposal of diseased carcases, compulsory inoculation of contacts and prohibition of the movement of animals exposed to infection ? Failing legislation, can you suggest other means of improving existing conditions ?

(*e*) Is there any difficulty in securing sufficient serum to meet the demand ?

(*f*) What are the obstacles in the way of popularising preventive inoculation ? Is any fee charged, and, if so, does this act as a deterrent ?

(*g*) Do you consider that the provision of further facilities for research into animal disease is desirable ?

If so, do you advocate that such further facilities should take the form of—

(*i*) an extension of the Muktesar Institute, or

(*ii*) the setting up, or extension of, Provincial Veterinary Research Institutions ?

(*h*) Do you recommend that special investigations should be conducted by—

(*i*) officers of the Muktesar Institute, or

(*ii*) research officers in the Provinces ?

(*i*) Do you recommend the appointment of a Superior Veterinary Officer with the Government of India ? What advantages do you expect would result from such an appointment ?

16. Animal Husbandry.

(*a*) Do you wish to make suggestions for—

(*i*) improving the breeds of livestock,

(*ii*) the betterment of the dairying industry,

(*iii*) improving existing practice in animal husbandry ?

(*b*) Comment on the following as causes of injury to cattle in your district—

(*i*) Overstocking of common pastures,

(*ii*) Absence of enclosed pastures, such as grass borders in tilled fields,

(*iii*) Insufficiency of dry fodder such as the straw of cereals or the stems and leaves of pulses,

(*iv*) Absence of green fodders in dry seasons,

(*v*) Absence of mineral constituents in fodder and feeding stuffs.

(*c*) Please mention the months of the year in which fodder shortage is most marked in your district. For how many weeks does scarcity of fodder usually exist ? After this period of scarcity ends how many weeks elapse before young growing cattle begin to thrive ?

(*d*) Can you suggest any practicable methods of improving or supplementing the fodder supply that would be applicable to your district ?

(*e*) How can landowners be induced to take a keener practical interest in these matters ?

PART IV

17. Agricultural Industries.

(*a*) Can you give any estimate of the number of days of work done by an average cultivator on his holding during the year ? What does he do in the slack season ?

(*b*) Can you suggest means for encouraging the adoption of subsidiary industries ? Can you suggest any new subsidiary industries to occupy the spare time of the family which could be established with Government aid ?

(*c*) What are the obstacles in the way of expansion of such industries as beekeeping, poultry rearing, fruit growing, sericulture, pisciculture, lac culture, rope making, basket making, etc. ?

(*d*) Do you think that Government should do more to establish industries connected with the preparation of agricultural produce for consumption, such as oil pressing, sugar making, cotton ginning, rice hulling, utilisation of wheat straw for card-board, utilisation of cotton seed for felt, fodder, oil and fuel, utilisation of rice straw for paper, etc. ?

(*e*) Could subsidiary employment be found by encouraging industrial concerns to move to rural areas ? Can you suggest methods ?

(*f*) Do you recommend a more intensive study of each rural industry in its technical, commercial and financial aspects, with a view to, among other things, introduction of improved tools and appliances ?

(*g*) Can you suggest any other measures which might lead to greater rural employment ?

(*h*) Can you suggest means whereby the people could be induced to devote their spare time to improving the health conditions of their own environment ?

18. Agricultural Labour.

(*a*) What measures, if any, should be taken to attract agricultural labour from areas in which there is a surplus to—

(*i*) areas under cultivation in which there is a shortage of such labour ? and

(*ii*) areas in which large tracts of cultivable land remain uncultivated ?

Please distinguish between suggestions designed to relieve seasonal unemployment and proposals for the permanent migration of agricultural population.

(*b*) If there is any shortage of agricultural labour in your Province, what are the causes thereof and how could they be removed ?

(*c*) Can you suggest measures designed to facilitate the occupation and development, by surplus agricultural labour, of areas not at present under cultivation ?

19. Forests.

(*a*) Do you consider that forest lands as such are at present being put to their fullest use for agricultural purposes ? For instance, are grazing facilities granted to the extent compatible with the proper preservation of forest areas ? If not, state the changes or developments in current practice which you consider advisable.

(*b*) Can you suggest means whereby the supply of firewood and fodder in rural areas may be increased ?

(*c*) Has deterioration of forests led to soil erosion ? What remedies would you suggest for erosion and damage from floods ?

(*d*) Can you indicate any methods by which supply of moisture in the soil, the rainfall and supply of canal water can be increased and regulated by afforestation or by the increased protection of forests so as to benefit agriculture ? Would the same methods be useful in preventing the destruction by erosion of agricultural land ?

(*e*) Is there an opening for schemes of afforestation in the neighbourhood of villages ?

(*f*) Are forests suffering deterioration from excessive grazing ? Is soil erosion being thereby facilitated ? Suggest remedies.

20. Marketing.

(*a*) Do you consider existing market facilities to be satisfactory ? Please specify and criticise the markets to which you refer, and make suggestions for their improvement.

(*b*) Are you satisfied with the existing system of marketing and distribution ? If not, please indicate the produce to which you refer and describe and criticise in detail the channels of marketing and distribution from the producer to the consumer in India (or exporter in the case of produce exported overseas). State the services rendered by each intermediary and whether such intermediary acts in the capacity of merchant or commission agent, and comment upon the efficiency of these services and the margins upon which such intermediaries operate. Please describe

the method by which each transaction is financed, or in the case of barter, by which an exchange is effected.

(*c*) Do you wish to suggest steps whereby the quality, purity, grading or packing of agricultural produce may be improved, distinguishing where possible between produce destined for—

(*i*) Indian markets ?

(*ii*) Export markets ?

(*d*) Do you think that more effective steps might be taken to place at the disposal of cultivators, merchants and traders information as to market conditions, whether Indian or overseas ; crop returns ; complaints as to Indian produce from wheresoever originating ; and agricultural and marketing news in general ?

21. Tariffs and Sea Freights.

Do existing (*a*) customs duties, both import and export, and (*b*) sea freights adversely affect the prosperity of the Indian cultivator ? If so, have you any recommendations to make ?

22. Co-operation.

(*a*) What steps do you think should be taken to encourage the growth of the co-operative movement—

(*i*) by Government,

(*ii*) by non-official agencies ?

(*b*) Have you any observations to make upon—

(*i*) Credit societies ;

(*ii*) Purchase societies ;

(*iii*) Societies formed for the sale of produce or stock ;

(*iv*) Societies for effecting improvements—*e.g.*, the digging of wells and the construction of bunds, walls and fences, or the planting of hedges ;

(*v*) Societies formed for the aggregation of fragmented holdings and their redistribution in plots of reasonable size ;

(*vi*) Societies for the co-operative use of agricultural machinery ;

(*vii*) Societies for joint farming ;

(*viii*) Cattle breeding societies ;

(*ix*) Societies formed for any purpose connected with agriculture or with the betterment of village life, but not specified above ?

(*c*) Where co-operative schemes for joint improvement, such as co-operative irrigation or co-operative fencing or a co-operative consolidation of holdings scheme, cannot be given effect to owing to the unwillingness of a small minority to join, do you think legislation should be introduced in order to compel such persons to join for the common benefit of all ?

(*d*) Do you consider that those societies of which you have personal knowledge have, in the main, achieved their object ?

23. General Education.

(*a*) Do you wish to make observations upon existing systems of education in their bearing upon the agricultural efficiency of the people ? If you make suggestions, please distinguish, as far as possible, between—

(*i*) Higher or collegiate,

(*ii*) Middle school, and

(*iii*) Elementary school education.

(*b*) (*i*) Can you suggest any methods whereby rural education may improve the ability and culture of agriculturists of all grades while retaining their interest in the land ?

(*ii*) What is your experience of compulsory education in rural areas ?

(*iii*) What is the explanation of the small proportion of boys in rural primary schools who pass through the fourth class ?

24. Attracting Capital.

(*a*) What steps are necessary in order to induce a larger number of men of capital and enterprise to take to agriculture ?

(*b*) What are the factors tending to discourage owners of agricultural land from carrying out improvements ?

25. Welfare of Rural Population.

(*a*) Outside the subjects enumerated above, have you any suggestions to offer for improving hygiene in rural areas and for the promotion of the general well-being and prosperity of the rural population ?

(*b*) Are you, for instance, in favour of Government conducting economic surveys in typical villages with a view to ascertaining the economic position of the cultivators ? If so, what, in your opinion, should be the scope and methods of such enquiries ?

(*c*) If you have carried out anything in the nature of such intensive enquiry, please state the broad conclusions which you reached.

26. Statistics.

(*a*) Do you wish to make suggestions for the extension or improvement of the existing methods of—

(*i*) ascertaining areas under cultivation and crops ;

(*ii*) estimating the yield of agricultural produce ;

(*iii*) enumerating livestock and implements ;

(*iv*) collecting information on land tenure, the incidence of land revenue and the size of the agricultural population ;

(*v*) arranging and publishing agricultural statistics ?

(*b*) Have you any other suggestions to make under this heading ?

MINUTES OF EVIDENCE

TAKEN BEFORE THE

ROYAL COMMISSION ON AGRICULTURE

Tuesday, November 30th, 1926

CALCUTTA

PRESENT:

The MARQUESS OF LINLITHGOW, D.L. (*Chairman*).

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S.
Sir THOMAS MIDDLETON, K.B.E., C.B.
Rai Bahadur Sir GANGA RAM, KT., C.I.E., M.V.O.
Sir JAMES MACKENNA, KT., C.I.E., I.C.S.
Mr. H. CALVERT, C.I.E., I.C.S.
Raja Sri KRISHNA CHANDRA GAJAPATI NARAYANA DEO of Parlakimedi.
Professor N. GANGULEE.
Dr. L. K. HYDER.
Mr. B. S. KAMAT.

Mr. J. N. GUPTA, I.C.S.
Rai A. C. BANNERJI Bahadur. } (*Co-opted Members*).

Mr. J. A. MADAN, I.C.S.
Mr. F. W. H. SMITH. } (*Joint Secretaries*).

Mr. R. S. FINLOW, B.Sc., F.I.C., Director of Agriculture, Bengal, and Mr. K. McLEAN, Assistant Director of Agriculture, Bengal

Replies to the Questionnaire

QUESTION 1.—RESEARCH.—(*a*) The organisation of the Bengal Agricultural Department for research has been explained in several memoranda, submitted to the Commission in June 1926.

The system of research has worked satisfactorily as far as it has been applied, and very valuable results have been achieved in the production of improved strains of staple crops; investigation of manurial necessities of the various types of soil in the Province; improvement in sericultural practice, etc. Much more research is needed however and some important matters have not yet been touched, *e.g.*, irrigation, poultry, fruit, etc. It is also of great importance to carry out a soil survey at the earliest possible date in order to enable advice in regard to manurial results to be given without the delay involved in soil analysis.

Irrigation may prove to be the crucial factor in deciding whether Bengal shall make an appreciably larger advance in agricultural prosperity than would otherwise be the case.

Increasing the supply of fodder must be, in any tract, a question of cultivation during the dry weather if a corresponding diminution of the human food supply is not to take place, and irrigation is the only key to hot weather cultivation in Bengal or elsewhere.

It will be gathered that while results have already been obtained which are amply sufficient to prove to demonstration the value of careful scientific investigations into Bengal agriculture, there is still much to be done including several lines of work which have not yet been touched. Much of this research is of local importance and must be done by increasing the staff of local experts. For instance it has already been arranged that cattle, poultry and irrigation, are each to have their own special officers; but fruit and lac, which probably have considerable prospects of expansion in Bengal still await attention. On the other hand, cotton, paddy, oil-seeds, pulses, Bimlipatam jute, hemp, etc., are all-India crops, and it is to be considered whether an extra-Provincial or all-India organisation would not in the end do greater service on the investigation of these crops. Jute is also now grown in four Provinces, *viz.*, Bengal, Bihar, Assam and the United Provinces and may be included on these grounds. Much work has of course already been done on jute by the Bengal Department of Agriculture and it is probable that for some years the races of jute already available as a result of this work may not be much improved on. On the other hand, a hybrid or a mutation may arise which will give yields far higher than the races now in existence. At the same time the subject of manures requires much further investigation and this is of great importance, as jute is one of the crops in a rotation which receives manure. If sugarcane is also in the rotation, it probably receives the bulk of the manure, but otherwise jute takes its place in this respect.

The success of the Indian Cotton Committee has led to a suggestion that the principle on which this Committee is established could, with advantage, be extended to other crops or groups of crops and that, while not replacing local research, the Government of India, working through such committees, could supplement local research on the respective subjects. Such a suggestion seems worthy of examination. In the first place it is admitted that prosperous agriculture is the most potent influence making towards the welfare of the State, and every reasonable suggestion is therefore worthy of examination. It is possible that under provincial control research may not prosper as it should, and a system of committees as mentioned above would probably not be subject to the same influences and would insure that investigations into any particular subject would not languish. Secondly, when each Province is working in a watertight compartment as it were, there must be a good deal of unnecessary overlapping which could be avoided. Another object served would be that prominent members of the respective trades would become collaborators in scientific investigations into the staples in which they are commercially interested, a matter of great importance. Moreover, at least a portion of the cost of the work of the committee would be recovered by a cess on the produce in question. There are powerful arguments in favour of such a scheme and it would appear that they should receive serious attention. It is necessary to say that there would be no object in the Government of India assuming responsibility for all research, any more than the Central Cotton Committee does so as far as cotton research is concerned. The Provincial Governments still continue research into cotton, their work being probably stimulated rather than the reverse, by suggestions, or criticism, and possibly to some extent by a spirit of emulation. Thus while such research committees would not tend to discourage local research, they would greatly help local departments in carrying out work for which men and funds are not available locally.

In regard to the indigenous theory and the traditional methods of Indian agriculture, it seems that every expert working in this country must be aware, and take account, of local conditions. It would be different if the research work were not being done on the spot—in Europe for instance.

(*b*) & (*c*) are both answered in the above, which also deals with (*a*) and (*b*) of Question 4.

QUESTION 2.—AGRICULTURAL EDUCATION.—(*i*) & (*ii*) At the present time there is no institution for higher agricultural education in North-Eastern India. The Agricultural College at Sabour, then in the Province of Bengal as it was after the first partition in 1905, by arrangement catered for Eastern Bengal and Assam. Sabour was closed in 1922 because of lack of students from the Province of Bihar in which Sabour was included after the repartition of Bengal in 1912. The history of Sabour is that at first, as long as it was thought that the course might provide an easy entry into Government service, the College was full of students, but when no Government posts could be offered, the entries declined rapidly. It is still not certain that the demand has increased since 1922; but Bengal will soon have to recruit considerably more agricultural officers in the subordinate grade, and the number of holders of Sabour diplomas who are still disengaged is very small. This is where Bengal may be badly held up. At the same time there is no doubt that the old Sabour course was woefully deficient and that the Sabour students who joined this department were of no practical use without further training. The entrance qualification for Sabour was Matriculation, and it appears that practically no boys take any science subject for Matriculation. Therefore recruits for Sabour arrived with no knowledge at all of science. Moreover, many recruits were town-bred boys;

and these had not only, in a two years' course, to assimilate the elements of science on which the course was based, but to absorb the principles of practical agriculture—an obvious impossibility. We have now found that an average Sabour graduate only becomes of real use as a District Agricultural Officer after he has been sent for training to the Dacca farm and attached in turn to the Expert Sections and as an Overseer on the farm. In fact one or two of the most efficient agricultural officers have first spent some years as Assistants in the Expert Sections at Dacca. Their work during this period not only makes them thoroughly familiar with the essentials of the research which is being conducted at Dacca; but the field work involved in the research gives them a reasonable practical training. Such men make efficient propaganda agents and their experience at Dacca soon enables them to run a small district farm of 20 acres or so quite creditably. There is therefore reason for believing that a preliminary training in pure science, followed by two years' practical work at the Dacca farm, is capable of producing a reasonably efficient District Agricultural Officer, who knows sufficient to enable him to benefit by experience.

This was the basis on which the scheme for the Dacca Agricultural Institute was drawn up. It contemplates taking youths, preferably of agricultural parentage, and with a preliminary training in pure science, up to Intermediate Science standard. Accepted candidates will first receive another year's special tuition in pure science including physics, chemistry and botany, after which they will spend two years over an almost entirely practical course at the proposed Institute. The details of the practical course are given in the draft syllabus.

The Secondary Agricultural School at Dacca is the only institution in Bengal which exists specially for teaching agriculture. Two such schools were originally established, the second being at Chinsura. It will be seen that the schools were full so long as demonstrators (Lower Subordinate Agricultural Service) were being appointed, but they emptied as soon as retrenchment put an end, for the time being, to the demand for demonstrators. The Chinsura School was closed in 1924 under orders of retrenchment and, in the meantime, Dacca School, having only had about half its complement of students, the vacant places have been utilised to give demonstrators already in the service a refresher course.

It will thus appear that there is no great genuine demand for agricultural education as such and that there is at present no indication of a demand for additional institutions. The reason is that there is a general impression that agriculture is not a profession for a gentleman and the almost purely literary curricula at the schools encourage this.

It was in an attempt to produce a change towards a more practical training that, with Messrs. Gunn and Stapleton of the Education Department, steps were taken which led up to the sending of Mr. Stapleton's committee to study the Punjab system of agricultural classes in schools. This system has now been approved by Government in Bengal and, given approval of the Council, a start will be made in the next year, 1927.

Generally it would seem that a real demand for vocational agricultural education could not be expected before the mass of the people are aware, not only that there are facilities for such education, but also that it is likely to do real good. The introduction of agriculture into the curricula of schools on the Punjab system will do this by making boys learn in the ordinary course of their school career, and just as they learn geography or mathematics, that there is such a thing as improved agriculture; also that agriculture is not a degrading profession. This in itself will lead to a demand for further training at secondary schools and later at the Agricultural Institute—*vide Agricultural Journal of India*. Volume XI, Part I, January 1916.

(*iii*) The Punjab scheme contemplates that teachers of agriculture shall belong to the agricultural classes; but it does not seem to be essential that teachers of other subjects should necessarily be drawn from the country.

(*iv*), (*v*) & (*vii*) Dealt with above.

(*vi*) Pupils at the Dacca Agricultural School must be sons of people who are cultivators or directly connected with cultivation of the land.

(*viii*) Nature study has been tried in primary schools for years, but is making little or no progress, owing partly, it is said, to lack of training in teachers and consequent lack of interest. It would seem that the only way to ameliorate this state of affairs is to improve the course of training at the *Guru*-training schools, but whether such improvement is possible, as would properly equip a *guru* to interest children in nature study and gardening, we are unable to say. Only experience can decide and any extra training the *guru* may get at a reasonable cost, must all be in the right direction.

For the agricultural classes in middle and high schools, the farm of upto 5 acres must be preferable to a school garden, if only to make the boy demonstrate to himself the truth of what he has been told in the class regarding possible improvements in agricultural practice. The objection to the farm is that it is too expensive; but we think it should be looked on not only in the light of a school training ground but as a demonstration farm for the neighbourhood. If well run, such small farms, scattered all over the country

would be valuable aids in familiarising the public with agricultural improvement. It has been objected to the Punjab scheme that it will not touch the boy who does not go beyond a primary school. It is probable that apart from the doubtful wisdom of attempting to teach agriculture to mere children, the expense of a sufficiently qualified master for all primary schools would be prohibitive. In this case the small farms at middle or high schools would help to bring the boy who has left the primary school, as well as neighbouring cultivators, into visual contact with departmental recommendations for improvements in agriculture.

(*ix*) Of the number of Bengal students who attended the Sabour College, practically all have gone into Government service. All are not now in the Agricultural Department as, after retrenchment, some were taken into other departments.

Of students at the agricultural school at Dacca, the following information is available :—

The condition of entry into the school is that a candidate must be a son of a cultivator or be directly connected with the land. Of 45 old students of the school whose whereabouts are known, 24 are engaged more or less directly in agriculture. Sixteen have taken agriculture as their sole occupation either as farmers, fieldmen on estates or agricultural teachers in schools; four combine agriculture with shopkeeping and four are employed as agents by a manure firm. Two or three remain unemployed.

(*x*) *Vide* remarks on Question 2 (*i*) and (*ii*) above. The introduction of agriculture into the ordinary educational system will tend in this direction, especially as it becomes more and more realised that the openings for boys with purely literary education are limited. A third factor is that the cultivator, in jute growing tracts at any rate, is probably decidedly better off than the so-called *bhadralog*. The cultivator grows his own food to a very large extent, and, however high its price, he keeps enough to feed himself and family. On the other hand the *bhadralog* have to buy food, and suffer correspondingly when the price goes up. This will tend to drive the *bhadralog* youth towards agriculture. On the other hand it is important that the idea that a *bhadralog* must farm a large area of land should not be propagated. There is little or no good land to spare in Bengal and for every large farm a number of ordinary cultivators have to become landless labourers. This seems just what should be avoided, as a system of peasant proprietors, each with a stake in the country, tends towards political stability. The students from any ordinary course at an agricultural college must be, like the average raw graduate in science, of little use without considerable practical experience. This can only come in the case of agriculture from living in a farm and helping to work it.

In Bengal there is a training reserve of six agricultural officers (Subordinate Service) who are attached to the Dacca farm for further practical training. There is also provision at district farms and sericultural nurseries for sons of cultivators, and silk-rearers to come to farms or nurseries, at ordinary labourers' wages, on condition that they are taught improved practice in their respective professions. Even here it is being found that a whole year at a farm or a nursery tends in many cases towards a desire in the youth to forsake farming as a livelihood and to seek Government service. It has been suggested that, instead of one whole year in one period, two periods of six months each, at an appreciable interval from each other, might avoid this difficulty.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(*a*) By reference to the *Review of Agricultural Operations in India* 1923-24, and annual reports on the work of the Agricultural Department in Bengal it will be gathered that in ordinary circumstances the dissemination of improved seed is the first obvious step in improving the practice of cultivators, and this has been done on a large scale throughout India. Nearly all other improvements involve the expenditure of considerable capital which the ordinary cultivator cannot afford. Credit facilities on a large scale thus become necessary and moreover, the cultivator is apparently more cautious, where he knows he is involving himself in debt. He may have a bad season when perhaps manures, for instance, will not pay the cost of application.

In North-Eastern India a striking demonstration of how the cultivator, once convinced, is capable of taking up an improvement in a wholesale manner is the use of Messrs. Renwicks' iron sugarcane mills and boiling pans. Messrs. Renwicks' chief activity is the hiring out of these implements, which are to be found almost anywhere in Bengal or Bihar where sugarcane is grown. A considerable hiring fee is charged but an arrangement, once made, is a guarantee to the cultivator that he will be able to reap his sugarcane crop within a reasonable time. If a part of the machinery breaks and cannot be replaced at the local agency, a new part is brought up from headquarters by telegram and passenger train. The result is that substantial men well able to purchase sugarcane rollers and pans, deliberately go to Messrs. Renwicks. If they purchase their own machinery they require a *mistry* to repair it or are liable for heavy fees for repairs, probably completed at such a late date, that loss, or serious diminution of profits on the crop, may occur.

(*b*) It seems likely to become our experience that, having once "broken the ice" with cultivators, *i.e.*, having proved the genuine worth of what we have to recommend, the cultivator is prepared to trust us and to take our advice without question. Everything depends, firstly on the genuineness of the recommendation, and, secondly, on the agent making the recommendation. Even if the recommendation is a good one, its advocation by an admittedly incompetent person automatically creates difficulties. This is why we have always held that, once a result has been obtained and proved for any particular tract, the District Agricultural Officer is normally the deciding factor in the sequel. A cultivator instinctively recognises a competent man.

(*c*) and (*d*), 3 (*a*) and 3 (*b*) are answers to these questions.

QUESTION 4.—ADMINISTRATION.—(*a*) and (*b*), *see* answer to Question 1.

(*c*) (1) As regards the Agricultural and Veterinary Services, I have no doubt that rapid progress in both research and propaganda depends entirely on the quality of men available. Admitting the crucial importance of agriculture to the State it cannot be gainsaid that the prospects of the Agricultural Service should be such as to attract at least as good men as those who are recruited by any other service, not excluding the executive service. I am not entitled to speak for the Veterinary Service but I can vouch for the fact that the research work of the Bengal Department of Agriculture is absolutely sound and that its results are already applied on such a scale as to make the department an overwhelmingly profitable investment for the people of Bengal, *vide* Bulletins I and II of 1924-25; also departmental Annual Report for 1924-25 pages 21-23; also *Review of Agricultural Operations in India, 1924-25.*

QUESTION 5.—FINANCE.—Financial aid to cultivators will be necessary for all improvements involving expenditure of ready money. The hiring out of sugarcane crushing and boiling machinery by Messrs. Renwick & Co. of Kushtia [*vide* Question 3 (*a*)] shows that developments in this direction are possible. It would seem that similar arrangements would be possible if not advisable, not only in the case of tractors, but of other expensive implements such as harrows, ploughs and possibly threshers.

There seems some prospect that commercial firms may be prepared to take up a hire-payment system such as is done with sewing machines.

The Agricultural and Sanitary Improvements Act is capable of being applied to drainage and irrigation schemes, but not for the purchase of seeds, manures, implements, etc. An amendment of the Act to enlarge its scope in this direction is contemplated. In effect the Agricultural and Sanitary Improvements Act is equivalent to an extension of *taccavi*; which itself—*vide* Question 12—may be of considerable assistance as a preliminary to the formation of a co-operative supply society. Co-operation must of course be the ultimate essential method of financing the cultivator and if, as present developments promise, the co-operative societies become both supply and sale, as well as credit agencies, a very long step will have been taken in the solution of all the problems with which this question deals.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(*a*) (*i*) Of those who are forced to borrow some of the main causes may be—

(*a*) Comparative incompetence.
(*b*) Misfortune such as loss of bullocks by disease; destruction of property by fire and failure of crops, etc.
(*c*) Expenditure on marriages and other festivals.

(*ii*) The ordinary *mahajan* is the common source of credit.

(*iii*) The reasons preventing repayment are probably similar to those necessitating borrowing; but in addition, onerous terms of a loan may make repayment difficult or impossible.

Only a detailed enquiry can disclose the proportion of cultivators who are in debt. The proportion probably varies from district to district. It is common to think of the whole country-side being in hopeless debt but this is not the case, and a considerable proportion of cultivators are solvent. This is probably particularly true in the jute-growing districts of Bengal. For instance Jack (*Economics of a Bengal village*) says that 55 per cent of the population of Faridpur are free from debt and that only 1½ per cent owe an amount equal to a year's income, *i.e.*, are in what he calls "hopeless debt." There is little doubt that on the whole, jute is one of the most paying of all Indian crops. There have been bad lapses, *e.g.*, in 1914-18; but, on the whole, in the last 20 years jute may be said to have more than doubled in price, and the financial status of the jute cultivator has appreciated accordingly.

In the last year (1925-26) record prices were obtained and the cultivator who had made profits on the sale of Rs. 200, or more, per acre, certainly imported large quantities of corrugated iron to better his housing accommodation and to increase his godown space. In Eastern Bengal ryots are reported in many cases to have paid off their debts and it is

certainly true that they have held up the biggest jute crop on record, for better prices, in a way which would not have been dreamt of a few years ago.

In Bengal too the price of rice has continually appreciated and though, in actual value, it costs the cultivator more, on this account, to live, he produces the rice he eats, and the surplus brings him a much better price than formerly. In these respects the cultivator is probably more fortunate in Bengal than in other parts of India.

(*b*) and (*c*) We have not sufficient special knowledge of the subjects to examine the merits of particular measures for lightening the burden of debt; but generally, it is advisable that if a cultivator is forced to borrow, he should be able to do so at a reasonable rate; and excessive interest or other onerous terms should not be allowed. Moreover, there should be nothing in ordinary procedure which would tend to hinder a debtor from discharging his debt.

Control of credit of cultivators seems advisable but it would probably be very difficult and might cause trouble. In any case alongside such protective measures as the above, in view of the small resources of the cultivator, and the necessity of expenditure of capital on implements, manures, etc., if he is to materially better his condition, it is important that constructive schemes should render credit facilities for legitimate objects easily available. It is probable that if the cultivator forms a habit of borrowing to finance improvement, his attitude towards credit in general will change, and that he will be less inclined to borrow for purchases which are not wholly justifiable.

Increase of co-operative purchase and sale societies, land mortgage banks and an extension of *taccavi* would all help in this direction.

The ryot is and must be conservative, if only because he cannot afford to be otherwise; but we have ample experience of him to know that once he understands a new policy to be sound he will take to the reform in agriculture without hesitation.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—(*a*) & (*b*) This is discussed in detail in the Report on the Consolidation of Holdings in the Punjab by Messrs. McLean and Bose (*q.v.*) The points may be summarised as follows:—

In Eastern Bengal the benefits would not be so obvious as (1) reduction of boundaries would not occur as these are required for *bunding* water for transplanted paddy, (2) cultivators already live on their holdings not in distant villages, (3) improved implements are not necessary for paddy cultivation, (4) holdings are so small that no material benefit would be achieved.

In Northern and Western Bengal and in the *bhil* tracts consolidation of holdings would prove beneficial.

The system of land tenure in Bengal, entailing innumerable people with interest in the land, is an obstacle difficult if not impossible to overcome. Consolidation of holdings would mean fragmentation of *jotes* which would be strongly resented by the *jotedars*.

Further, the question of *salami* would have to be overcome. The whole matter requires investigation by a committee as proposed in the report.

(*c*) We consider that legislation on these points is necessary.

QUESTION 8.—IRRIGATION.—(*a*) (*i*) In Bengal the only canal at present used for irrigation is the Eden Canal in the Burdwan Division and this is only available in the monsoon and few succeeding months. A second canal to take off, like the Eden Canal, from the Damodar river, is in course of construction.

Investigation, it is said, has been made of the possibility of storing water in the highlands of Chota Nagpur, but apparently the difficulties are insuperable.

(*ii*) Years ago, in Western Bengal (Midnapore, Bankura, Birbhum and Burdwan districts) large *bunds* or tanks, were made on the slopes of the undulating country to hold water for irrigation of the paddy after the end of the monsoon. Gradually many *bunds* fell into decay but recently there has been a movement towards re-excavating them. Mr. G. S. Dutt, I.C.S., then Collector of Birbhum, and Rai A. C. Bannerji Bahadur were prominent in regard to this work.

Recently several small irrigation schemes involving the use of water from small rivers by means of a weir and sluice arrangement have been initiated in the districts of Bankura and Birbhum. Rai A. C. Bannerji Bahadur has been actively associated with several of them.

(*iii*) Wells are also used for irrigation in Western Bengal, especially in the potato-growing tract near Calcutta, and irrigation of tobacco from wells is resorted to in Rangpur, Northern Bengal.

Where there are tanks, burrowpits, and even from rivers, water is lifted by the *done* and the swing basket. These methods are common in Western Bengal, also, particularly in Eastern Bengal, for the irrigation of *boro* paddy in the hot weather.

(*b*) In memoranda on fodder, etc., already submitted to the Commission; also in other publications, including departmental annual reports, etc., it has been pointed out that irrigation has great possibilities in Bengal. Irrigation schemes would all be

comparatively small, and outside Birbhum, Midnapore and Bankura nearly all would depend on the pumping or on lifting of water. In the comparatively high red soil tracts of the *barind*, and the Madhupur jungle, tube wells might be the best means of supplying water. At the same time rivers are never very far away, and the whole question needs investigation. In the highlands of Western Bengal the rivers are few, and the geological formation renders it improbable that artesian wells or tube wells could be hoped for as a source of water. Apparently therefore this tract must largely depend on the *bunds* and on the small river schemes already described. In the rest of Burdwan Division, the Presidency Division, Eastern Bengal and many parts of Northern Bengal, *e.g.*, Bogra, Rajshahi, Malda, etc., there is little doubt that irrigation in the cold weather and especially in the early hot weather would enormously facilitate cultivation and would, in most years, ensure bumper crops. An Agricultural Engineer is about to be appointed in this Province but the importance of the problem is such, especially in the matter of fodder production, also cultivation of paying revenue crops like sugarcane, tobacco, potatoes, etc., that an investigation by a small Commission would be well justified.

QUESTION 9.—SOILS.—(*a*) (*i*) Lower Bengal is entirely deltaic and the rivers wander through it and change their courses as the process of filling up proceeds. In some tracts, particularly in the Burdwan and Presidency Divisions, interference with this natural tendency of the rivers to wander has resulted in serious deterioration of the surrounding country. Instances of this are to be found in the Hooghly and Howrah districts; also in Nadia, Jessore and Murshidabad districts. The deterioration in Howrah and Hooghly is apparently directly due to keeping the Damodar river within its present channel, whereas it would, under other circumstances, have overflowed the country and gradually raised it above its present level. As it is, much land is difficult to cultivate because it is too high for late transplanted paddy and yet there is so little really high land that tanks have to be dug to make house sites. Often only one crop in the year is possible, and the land lies idle for six months at a time. There is little doubt that deltaic Bengal has become populated a geological age before its time, and the legacies of fever, deterioration of rivers, etc., is at least partly due to this.

Certain portions of this tract are capable, if irrigation were available, either from rivers or from tube wells, of yielding considerable additions to the food and fodder supply of the country and this is one of the most promising avenues of development. There are two alternatives: One is to raise one portion of the area so as to make it *pucca* high land capable of growing good revenue crops like sugarcane, potatoes and tobacco, and lowering a corresponding portion so as to bring it into the real transplanted *aman* category. The other alternative is to grow the present crop of early maturing paddy on the land as it is and utilise irrigation for hot weather cultivation of catch-crop fodders, food crops, etc. The former, though probably the more efficient, would also be very expensive, while the increment to be obtained from irrigation would be a considerable immediate help. Moreover, if, in the end, pressure on the land becomes extreme the first alternative could still be employed.

In the Presidency Division many rivers have "deteriorated" *i.e.*, their channels have gradually silted up and the water, if available as it used to be, flows elsewhere. It has been suggested that the large irrigation works upcountry, depending on the Ganges and the Sone rivers, are partly responsible for this; but in the rains the volume of water is not seriously diminished and the Ganges floods are as high as ever they were. It has also been suggested that insufficiently large bridges and culverts under railways and roads do not afford sufficient velocity of flow in the river channels which have deteriorated to keep them alive. There are certainly some striking instances of this where a bridge of, say 100 feet span, is placed over a river whose channel is 300 feet wide. This can only result in deterioration. On the other hand natural processes are undoubtedly at work in this deltaic country, where the tendency is for rivers to leave their courses in comparatively high land, for lower tracts, which have to be gradually raised by deposition of silt from the rivers. The fact that, in such country, the banks of the rivers are the highest land in the tract is evidence of this tendency.

Jessore and Nadia districts seem to be two of the districts which are most affected by "deterioration" and in both districts there are tracts which are described as "dying." The adjacent district of Faridpur also has problems which are similar though perhaps not quite so acute. Several years ago a scheme was examined for the rejuvenating of the river Bhairab in Jessore, and it was found that the *khals* or water courses connected with the *bhils* or depressions, which fill with water in the rains, were mostly silted up. The result is that the water from rivers does not flow into the *bhils* until the flood is high, and that when it does flow into the *bhils* the water rises so high that it may drown even deep-water paddy. Again, owing to the silted *khals* the water cannot get out of the *bhils* in time to allow of timely *rabi* (cold weather) cultivation and so crops in both seasons are affected. The result is bad crops followed by decreased resistive power on the part of the people. The latter entails fever which again reacts in a vicious circle. It would

appear that the obvious initial action required is the re-excavation of the *khals* between the rivers and the *bhils*. If this were done the latter would act their normal part of "spill" areas in the monsoon and as reservoirs for feeding the rivers in the cold weather. Definite instances of this are given in the note quoted above.

These problems are purely deltaic and are probably unique in India but, on account of the density of the population, they are urgently worthy of serious investigation as involving promise of increased production.

(*a*) (*ii*) Erosion is chiefly to be noticed in the rolling upland tracts of the districts of Birbhum, Bankura and Midnapore in Western Bengal.

The problem is a complex one. Originally the greater part of the country was probably clothed with *sal* forest which, besides possibly affecting the distribution of the rainfall, if not its total quantity, held up rain water, and caused its gradual filtering down to the river channels. In course of time the forests have receded before cultivation, first to the tops of the undulations, and later, in many cases, have vanished altogether. In such tracts heavy rain gradually washes all surface soil down the slopes towards the bottom of the valleys. In the next year the rain runs more quickly off the upper portions of the slopes and carries more surface soil with it. This is in short a description of erosion, and in the end the tops of the undulations are bare and hold no rain water, which rushes down the slopes into the river channels almost as soon as it is precipitated from the clouds. The result is, firstly, that water which should have percolated slowly through the soil of the upper slopes is not available and consequently the paddy fields on the lower portions of the undulations lack moisture to ripen their crops. This is exactly what is happening to-day in large tracts in Western Bengal. Secondly, the water rushing so quickly into the river channels brings the latter into heavy flood which causes frequent and serious damage in the lower reaches of the river, *viz.*, the sub-divisions of Contai and Tamluk in the district of Midnapore.

The amount of erosion which is taking place in Western Bengal at the present time is serious and will appreciably affect the potential area for the production of food in Bengal. The problem is one of importance in view of the encouraging results with cotton, fodder crops, pulses, etc., which are being obtained at the Government farms, in the districts of Bankura and Birbhum.

The only means of saving many thousands of acres of good land in Western Bengal from destruction are by (*a*) reafforestation and (*b*) terracing. A judicious combination of each of these could, we have reason to believe, gradually reclaim even areas which have suffered seriously from erosion.

(*a*) (*iii*) There are no large areas of unoccupied land in Bengal and such small areas as are available are naturally the most difficult. These would be in the undulating country of Western Bengal; in the *barind* in Northern Bengal; or the Madhupur jungle tract in Eastern Bengal. It seems, however, that in and around village sites there is often great waste of land which could grow vegetables and other intensively cultivated crops but which are to-day, in the majority of cases, untidy areas of scrub jungle. It is allowed that there must be a certain amount of shade near a house; also that there must be space for cattle, and so on; but with all this there seems to be unnecessary waste of good land. Suitable propaganda would be the means of bringing such land into use.

QUESTION 10.—FERTILISERS.—(*a*) The increased use of fertilisers, whether natural or artificial, is vital to the scheme of agricultural development in India.

Even from the point of view of improved crops, the fertiliser question is likely to be critical in the course of time, because the improved crops mean an appreciably greater drain on the soil, which must be replaced if the improved crops are to be of permanent benefit. But apart from this, an extra increment of profit is to be looked for on many soils from a general use of fertilisers. For instance, it has been shown at Dacca on the old red alluvium that phosphates, lime and potash (the latter for jute) can all be profitably employed; while recent results with ammonium sulphate strongly indicate that it is a useful manure on limed lands for jute, transplanted paddy and sugarcane.

As a contrast to the old red alluvium the new alluvium or grey silt is usually rich in potash and phosphates and reliable results with nitrogenous fertilisers are not yet available.

(*b*) The only artificial fertilisers in common use in Bengal are oil-cakes and, to a certain extent, bone. The bone is sold by large firms, but cakes, bought from small dealers, are often badly adulterated. Legislation has been suggested to penalise adulteration, but this would probably not help the ordinary small cultivator who buys his cake when he requires it, and possibly does not know whether it is adulterated, or is so used to adulteration, that he does not make any vocal protest. As far as I can see, the co-operative society is the most hopeful way of ensuring that cultivator's cake manures are sold pure. It should be fairly easy for members of a co-operative society to pool their requirements, which would be bought under a guarantee from firms of repute. In the event of legislation the co-operative societies could have the stocks of cake dealers analysed and prosecute dishonest men.

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As an adjunct, in tracts where sales are likely to justify it, there is a tendency for large manure firms to establish local agencies. It has even been proposed that Government farms should be utilised in this respect by the firms.

(*c*) Where departmental work is already known, there will be little difficulty in popularising fertilisers, provided credit facilities are available. In most such places it should not be difficult to form a co-operative society if there is not one already. In other places there is a difficulty because, although the department may demonstrate, there seems to be an initial difficulty in forming a co-operative society, and it has been suggested that this is where *taccavi* loans would be of real use. At present, in Bengal at any rate, *taccavi* loans are unpopular, not only with the Collector and his staff, because of the difficulty of collection, but also with the cultivators, because they are associated with times of shortage and general distress. It has already been suggested to Government by us and by Mr. Peddie, Collector of Malda, that the *taccavi* loan might realize a more normal object by being utilised as a preliminary to the formation of co-operative societies. For this purpose the Collector, in consultation with the Director of Agriculture could select a few cultivators of good reputation to receive the loans for purchase of manures. These few people would then use the manures, and their crops would be a demonstration, on a sufficient scale, in the neighbourhood to bring the requisite number of cultivators together for the formation of the society. Of course, in places where credit societies already exist, the matter is comparatively simple.

(*d*) The only instance of considerably increased use of artificial manure in this Province is oil-cakes in the potato-growing tracts near Calcutta, and to some extent in sugarcane growing tracts. There is also a distinctly increasing demand in red soil tracts for bone for transplanted paddy. As a result of propaganda, the use of water-hyacinth both rotted and as ash, is now practically universal in infected tracts, in Eastern Bengal. Instances have been noted where water-hyacinth has been carted upwards of a mile from a *bhil* to manure transplanted paddy higher up.

(*e*) In Bengal the value of bone phosphate on red soils is now well-known; rock phosphate does not seem to produce anything like the same result as bonemeal. As all red soils are acid and as practically all the remainder contain no carbonate of calcium, the use of superphosphate is not recommended.

Nitrates have not so far produced the results which might be expected. They have, however, not yet been thoroughly investigated. Probably they would do better on *rabi* crops, than for the *kharif* season. On jute nitrate of potash as a top dressing produced a better result than nitrate of soda. Calcium cynamide has not given encouraging results so far.

Ammonium sulphate on jute is promising on limed land. It is to be objected to as leaving an acid residue, which is inadvisable on acid soils, which have not been limed.

It may be concluded that beyond bone, lime and potash, the use of artificial fertilisers has not yet been sufficiently investigated in Bengal.

(*f*) In many parts of Bengal the use of cowdung seems necessary for household purposes, unless cheap supplies of coal or cheap oil-burning stoves become available. Charcoal is steadily rising in price.

QUESTION 11.—CROPS.—(*a*) (*i*) Much work has been done on the production of pure line cultures of staple crops in Bengal and improved types of jute and paddy are now being taken up on a large scale. The same applies to sugarcane though the selection work on this crop has not been done in Bengal. Tobacco cultivation is spreading as a result of departmental efforts and work is in progress on cotton, pulses and oil-seeds, as well as on newly imported crops, *vide* various departmental Annual Reports, Bulletins Nos. I and II of 1924, etc.

(*ii*) New crops recently introduced are :—ground-nuts into Western Bengal; potatoes into Eastern Bengal; several fodder crops including a millet from Manchuria; *rheana* from Bombay; Guinea grass, soybean, etc.; all these are promising in certain areas; but probably investigation will disclose further possible improvements. For instance, late maturing ground-nuts are of little use in Western Bengal as, if the soil hardens before the nuts ripen, the cost of digging is prohibitive. Selection has therefore been directed towards an early ripening type, one of which now appears to have been found.

Potato cultivation was demonstrated in Eastern Bengal in the early years succeeding the formation of the Department of Agriculture and is now well known in the tract. The main difficulty is that of obtaining seed from the hills, as plains seed gives tubers inferior in size.

Of the fodder crops, the Japanese millet (*pennisetum sp.*) is very promising, as it is a rapid grower and ripens seed in about 2 months. It is thus a genuine catch-crop and, given water, it can be grown over the greater part of the year. Several crops can be obtained without resowing, and at Dacca 4 cuttings totalling about 500 maunds (18 tons) per acre have been obtained in about 4 months. One advantage of the plant is that it

is succulent and nutritious throughout whereas *sorghum sp.* becomes very hard and pithy at the base of the stem.

Rheana takes 4-5 months to mature but, like Japanese millet, remains succulent throughout the stem. It seems a very promising crop and, in combination with Japanese millet and *juar (sorghum sp.)*, would be used to carry the green fodder on, after the end of the rains, till the end of the year, when silage would be available. The above of course refers to unirrigated tracts.

Guinea grass is an extraordinarily useful fodder crop, a very rapid grower and a very heavy yielder of succulent fodder as long as there is moisture in the soil.

Some varieties of soybeans obtained from the Director of Agriculture in Bihar have shown considerable promise in Western Bengal.

As indicated elsewhere, *vide* departmental Annual Reports for 1924-25 and 1925-26, Western Bengal, *i.e.*, the rolling upland border districts of Birbhum, Bankura and Midnapore, grow practically nothing put paddy on the slopes. The rice crop on the upper-terraces is always precarious and attempts are being made to substitute highland *kharif* crops. Cotton, *arhar*, millets, *til*, ground-nut, all seem to do well and to offer a considerable variation in the present crop programme.

(*a*) (*iii*) Views on the distribution of seeds have already been submitted to the Commission in various annual reports.

(*a*) (*iv*) As a rule, in Bengal wild animals do not do very serious damage. The country adjacent to the Ganges is infested with pigs and Government is now being asked to empower the Collector of Rajshahi to pay rewards for the destruction of pigs in the Natore sub-division.

Jackals do some damage to soft sugarcane which is unprotected by fencing or by wrapping with trash ; also to maize, which however is not a common crop. In parts of the Burdwan and Presidency Divisions, monkeys do damage.

(*b*) As mentioned in the reply to Question 11 (*a*) (*i*), we are endeavouring to replace the precarious paddy crop on the highland in Western Bengal by heavier yielding food crops.

(*c*) Please see above.

QUESTION 12.—CULTIVATION.—(*i*) It is possible that highland cultivation and also low *bhil* land cultivation might be considerably helped by tractors. But it would not do for cultivators to form societies for the purchase of such machinery, unless the number of members is sufficiently great to justify the establishment of a comprehensive workshop for repairs, in charge of a really competent *mistri*. Without such precautions the tractors would only entail serious loss to the owners.

In many tracts, the substitution of iron ploughs for the country plough virtually adds to the fertility of the soil. The spring-tined harrow is a very useful implement for these tracts, also the drag harrow, but all are expensive and daily becoming more so. Perhaps the benefit of these implements could be assured to the cultivator by co-operative effort or by deferred payment. One of the main difficulties in regard to improved implements is the smallness of the bullocks and over-cautiousness of the cultivator in regard to his bullocks even when they are big enough.

(*ii*) *Vide* above Question (11).

An increase in the cultivation of revenue-producing crops like sugarcane, tobacco, potatoes, etc., is possible on a considerable scale in Bengal. Results have already been achieved in this direction and the work continues.

The prospects of profitable changes in rotation will be much enhanced when the problem of irrigation for Bengal is solved. It is probable that the production of fodder crops will have to be done in the dry weather season if the human food supply is not to be curtailed.

QUESTION 13.—CROP PROTECTION—INTERNAL AND EXTERNAL.—(*i*) The Government of India Crop Protection Act, if properly administered, seems sufficient protection against external infection.

(*ii*) The question of internal measures is one which, so far as I know, has not been sufficiently investigated.

Taking the Province of Bengal, it is possible that a pest promptly reported from one district might enable precautions to be taken in neighbouring tracts. For instance, the hairy caterpillar (*diacrisia obliqua*) one of the most voracious and destructive of pests, can be detected several yards away by bending and examining the under-surfaces of the leaves of a crop of jute. If the pest be detected in time it can be checked in the area in which it is detected and news of its attack can at the same time be sent to adjacent tracts.

The question of protection by parasites of common pests is under investigation. The parasite of the common boll-worm of cotton, discovered by Lefroy, is a case in point.

QUESTION 14.—IMPLEMENTS.—(*a*) Attempts have been made to improve the Indian plough by putting an up-to-date plough body on the pole and handle of the country implement. The bastard implement produced is unsatisfactory.

The only solution is to adapt the up-to-date plough *in toto* to local conditions.

Several firms put out ploughs, some good and some indifferent, but nearly all too expensive, and this prevents their adoption on a large scale.

All general purpose ploughs in India should be fitted with a bar point, which is much more convenient for the cultivator than complicated shares and points.

The S. T. harrow is an implement which is invaluable in Bengal but here again it gets further and further away from the cultivator, as prices rise year by year. The difficulty with modern implements in India is that makers do not know the local conditions and will not modify their implements to meet local conditions. They point out that modification means altering their plant at a large cost and the demand from India would not meet the cost.

Makers require to have a practical representative in India. They are generally represented by agents who know nothing of the practical use of the implements. A firm marketing a good plough, light and strong, at a reasonable price, will have a big turnover.

(*b*) One great difficulty with the demonstration of implements is the belief of the cultivator that his cattle are not strong enough to draw the implement. It will take time to overcome this prejudice.

The money question is the chief obstacle and could be overcome by selling on the hire-purchase system as is done throughout the villages with sewing machines.

(*c*) Replies have been incorporated in (*a*) and (*b*) above.

QUESTION 15.—VETERINARY.—The only remark it is desired to offer on this subject is that the Veterinary Department should be independent of the Department of Agriculture. Both departments should of course work in close collaboration.

QUESTION 16.—ANIMAL HUSBANDRY.—(*a*) (*i*) Bengal is not a cattle-breeding Province. There are no breeders in the proper sense of the term and the only improvement in the cattle has been through Government agency.

Up to the present the lines of work have been—

At Rangpur—

(1) Improving a local herd by selection.

(2) Raising a cross Hissar—local herd of good milkers and fixing a type suited to the Province.

At Dacca—Raising a herd of pure Sindhis.

The improvement can be seen from the fact that the minimum yield per lactation period of 300 days of animals admitted to the herd has been raised from 500 lbs. in 1916 to 3,000 lbs. at the present day.

The demand for bulls is increasing and the question of breeding centres to bear the demand is under discussion.

To meet the demand for dairy cattle for towns' milk-supply, an Ayrshire bull is stationed at Dacca for crossing with local cows.

(*ii*) The question of improvement of the dairy industry is linked up with education. An up-to-date dairy is provided for in the Dacca Institute scheme and there is also on foot a scheme embracing a commercial dairy in Krishnagar where men can be thoroughly trained in the business.

(*iii*) *Vide* "The Improvement and Care of Cattle in Bengal," pages 1-9.

(*b*) (*i*) Common pastures are practically without exception overcrowded. The grazing is also of very poor quality. The solution lies in the utilisation of waste areas for growing fodder crops.

(*ii*) There are small areas of grass borders between fields, the quality of the grazing varying with the locality. Where *dhub* grass abounds this grazing is good but rank unpalatable grasses predominate.

(*iii*) In some years there is a shortage of paddy straw; prices rule high; and cultivators are inclined to sell off the stocks they have. The cattle have to forage for themselves and there is very little difference between the roughage they pick up and the paddy straw it replaces, as the latter is of poor feeding value.

(*iv*) In Western Bengal the cattle certainly suffer during the hot weather but in Eastern Bengal early rains bring on the grass. As stated above, the grazing is of poor quality and fodder crops must be substituted.

(*v*) This is under investigation.

(*c*) The periods when there is scarcity vary throughout the Province and from district to district.

In the riverine tracts, a great proportion of the land is under water, from July to October, 3½ months. During this period the cattle are housed on the small island which constitutes the homestead and feed only on paddy straw and such fresh aquatic grass as can be taken out of the adjacent deep-water paddy crops.

On the high lands of Eastern Bengal the period of scarcity is from December to April when nor' westers come on, whilst Western Bengal suffers from December right up to the break of the rains in June.

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The term " thriving " hardly applies to Bengal cattle but in Western Bengal there is an improvement about a month after the rains break.

(*d*) By the introduction of fodder crops. Efforts are now being made by demonstration and propaganda to popularise the growing of crops recommended by the department.

(*e*) The landowner in Bengal is generally apathetic regarding agriculture. There are however several enthusiastic men in Bengal who realise they can do a lot of good and there are prospects of the numbers increasing.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(*a*) This differs from district to district and from village to village according to the type of land.

It should not be inferred that a cultivator who has 150 days on which he appears to do no work can be translated into an industrial concern. These off days are interspersed between crops and, moreover, on many of them he is occupied on domestic duties such as repairs to his house, sheds and *bunds* or cleaning tanks or *nullahs*.

A survey of Bengal will show that most of these men have other work to keep them occupied. In the deep-water paddy tracts they are fishermen, in Chittagong they are engaged in poultry-keeping and so on.

The ideal to aim at, however, is to have cultivation so intensive that the cultivator is occupied throughout the year. With proper irrigation facilities this is possible over the greater part of Bengal. In the one crop paddy land of Western Bengal and, to a more limited extent, in the *bhil* tracts of Eastern Bengal, it is not possible. In Western Bengal, where irrigation is not possible, the existing subsidiary industries require special attention and in the *bhil* tracts the fisheries should be organised.

(*b*) These subsidiary industries should be stimulated by providing better facilities for marketing the produce, and this matter should be taken up conjointly by the Co-operative and Industries Departments. The encouragement of the growing of tree cotton as hedge plants is another matter which has been advocated by this department. The cotton produced is sufficient to keep the female members occupied in spinning thread for their own clothing.

(*c*) There are no obstacles in the way of these industries beyond lack of organisation which has been referred to above. The department is already engaged in improving sericulture, and a poultry section is being established. There is a scheme now before Government regarding the establishment of a fruit section and it is proposed to take up the investigation of lac culture on a permanent basis.

The Department of Fisheries was retrenched on the recommendations of the Bengal Retrenchment Committee.

(*d*) These are trade questions and the best way of fostering these industries is to establish committees such as the Indian Cotton Committee with representatives from the traders concerned and Government.

Such committees foster production of the raw material but it is for the Co-operative and Industries Departments to organise societies for cotton ginning, rice-husking, etc., on a co-operative basis and the producting cultivators should have an interest in these concerns.

(*h*) This can be done by the introduction of rural science classes in schools as contemplated in the Punjab and by intensive propaganda by the different Government departments concerned.

QUESTION 18.—AGRICULTURAL LABOUR.—(*a*) Bengal is one of the most densely populated Provinces in India ; yet it employs many thousands of labourers from the Santhal Perganahs, Bihar and the United Provinces. Not only the jute mills of Calcutta and the coal-fields of Chota Nagpur absorb such labour ; the large jute-collecting centres like Narayanganj, Chandpur, Serajganj, etc., all employ large numbers of *Paschimwallas* and, for a big jute crop in Bengal, Biharis are also employed in the reaping of the crop. Moreover, most of the earth work for embankments, excavations, etc., in Bengal and Assam, is done by *Nunias* from the United Provinces. In the reaping and preparation of jute, Bihar labour, not so experienced as that of Bengal, is comparatively expensive as well as inefficient ; but as earth workers the men from Azimgarh are extremely efficient.

In Bengal, inspite of the large importation of labour from the west there is an unemployment problem and about three years ago a Government Committee was appointed to investigate it. The unemployment is not to be found among the cooly or the cultivator class ; but amongst *bhadralog* and Anglo-Indians ; in which communities there appears to be actual distress.

Needless to say the distress is not due to inability to obtain work to earn daily bread, but inability to obtain clerical or other work to the taste of the seeker. It is for this class of the population that it has been proposed to give facilities for the establishment of farms of considerable area much bigger than would satisfy the needs of the ordinary cultivator. If such procedure would lead to more intensive farming and greater production

per acre it is to be defended but not otherwise; as every big farm established would normally mean the ousting from their own land of a corresponding number of cultivators who would probably become landless labourers. It may be argued that there is still vacant land in the Sunderbans, in the Madhupur jungle tract in Eastern Bengal; the *barind* in Northern Bengal, and possibly also in parts of Western Bengal. This is true; but on the other hand all these tracts are comparatively inhospitable. In the *barind* the bulk of the cultivators are Santalis; while cultivators on the red soils of Eastern Bengal are migrating to more fertile land in Assam. It is to be considered whether the best thing would not be to settle unemployed *bhadralog* directly in Assam.

(*b*) There is, of course, always a large demand for labour in Calcutta and in the coal-fields. Elsewhere shortage of labour in Bengal is intermittent and depends to a considerable extent on the size of the jute crop. For a big crop Bihari labour comes in from the west. For the rice crop some migration of labour takes place. For instance, Chittagong, Noakhali and Barisal cultivators go to Burma to reap paddy, while labourers from Nadia go to Barisal for reaping the large *balam* paddy crop.

(*c*) There are few such areas in Bengal as are worth consideration in this respect.

In thinly populated tracts in Western Bengal and elsewhere, improved agricultural prospects would cause the population to expand naturally without immigration.

QUESTION 19.—FORESTS.—(*a*) Outside the Terai, Chittagong and the Sunderbans, there are practically no Government forests in the plains of Bengal.

In the Darjeeling Hills the Forest Department give facilities to agriculturists to grow crops on areas where the forest is being replaced by new.

In the Chittagong Hill Tracts the practice of *jhuming* is causing anxiety regarding the bamboo forests.

(*b*) It is possible that by careful cultivation of quick growing trees on village sites, supplies of firewood might be appreciably increased. In Western Bengal there are opportunities for re-afforestation but the difficulties are considerable as practically all the land is zamindari.

In Bengal the general question of fodder is not associated with forest grazing, because there are so few forests.

(*c*) and (*d*) Deterioration of forests in Western Bengal has led to erosion. The only methods of reclamation now would be terracing and replacing.

The terracing would naturally hold up moisture for lands lower down and correspondingly increase their agricultural possibilities. Even in the Madhupur jungle tract *sal* forests in Eastern Bengal considerable erosion is going on. In fact the whole system in the latter tract of highland intersected by *bydes* of low land, in which the drainage takes place towards the *bhil* and the river, are only the result of long erosion. This has now proceeded so far in the tract in question that the differences in level are nowhere more than a few feet. Erosion, however, still continues but may be stopped by terracing; *vide* answer to Question 9 (*a*) (*ii*).

QUESTION 20.—MARKETING.—There is room for organisation of markets and in the elimination of the middleman.

To take the case of jute. Between the cultivator and the export market on the one hand or the jute mill on the other, there may be four agencies, *e.g.*, the *faria*, *bepari*, *aratdar* or *mahajan* and the baler. The *faria* is a small dealer who buys small quantities of jute from the cultivator and sells to the *bepari*. The *bepari* is financed by the *mahajan* or *aratdar* and the latter takes the jute to the baler. This succession of middlemen is not universal of course. For instance, the *bepari* often deals direct with ryots and, if he is a wealthy man, he dispenses with the *aratdar*; on the other hand baling firms sometimes substitute the *aratdar* and advance money to *beparis*; while in Eastern Bengal the cultivator frequently deals with the baling firm direct, if an agency of the latter is within reasonable distance.

The *faria* is a dealer and not a commission agent; the *bepari* is a dealer or a commission agent according as he works on his own capital or on that of either the *aratdar* or the baler. The *aratdar* is of course merely a financier who takes interest—at the rate of annas 4 per maund of jute—on the money he advances.

The margins of the various middlemen may be estimated as follows:—

Faria—annas 2 to annas 6 according to the season.

Bepari—annas 4 to Re. 1.

Aratdar—annas 4.

Besides there are margins of the baling firms, say annas 10, including handling and storing, and freightage, insurance, etc., to Calcutta, annas 12.

Thus the difference between the price to the cultivator and the price to the mill, or the exporter, may be put at from Rs. 2 to Rs. 2-8 per maund, or, on an average, say, 20 per cent.

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During the last twenty years the average quality of jute has probably deteriorated. Twenty years ago, this was the subject of investigation and it was decided that no deterioration of the plant has taken place but that the method of preparation had become less careful. The margin between the prices of good and bad jute varies considerably. It may not be more than Rs. 2 per maund but on the other hand it may be considerably more. In the present year the producer of good quality jute is fortunate because the margin of price between good and bad quality jute is wide. On the whole, however, the tendency has been towards smaller margins between good and bad quality, with its consequent reaction on the cultivator and the class of fibre he produces.

(*c*) The co-operative jute buying organisation* now being established in Bengal aims at bringing the profits involved in quality, purity, grading and packing to accrue to the cultivator; but if the cultivator is able to eliminate the bulk of the middleman's profit between himself and the export baler, or the Calcutta mill, he will probably have achieved most of what is possible.

(*d*) All these suggestions may be put into practice, but the rate of progress in this direction will depend largely on the rate at which organisation of the cultivator proceeds.

QUESTION 23.—GENERAL EDUCATION.—The remarks under Question 2 refer to General Education and its proposed modification to suit an agricultural population.

QUESTION 24.—ATTRACTING CAPITAL.—(*a*) We do not consider that the establishment on a big scale of large farms by capitalists is economically sound. It would mean that the peasant proprietor, who is the backbone of agriculture in Bengal, would be turned out of his holding to become a casual labourer. Moreover, it is probable that the aggregate income per acre from large farms would be less than that from holdings farmed intensively. We consider that intensive cultivation of small holdings is the end to be aimed at and that it can be achieved, given sound advice and financial aid for purchase of manures, good bullocks, better implements, etc. This would of course attract a very large amount of capital particularly, if, as is desirable, irrigation is also provided.

In some "deteriorated" tracts, *e.g.*, in the districts of Nadia and Jessore, it may be possible, to re-excavate *khals*, and, generally, to take such measures as will free the tract from malaria. This could only be done by considerable expenditure of capital, whether by Government or by owners, or by societies, or companies, formed for the purpose, which would take over the land and sell it, after improvement, to peasant proprietors on deferred terms.

(*b*) Usually the tenant has occupancy rights, and if a landlord spends money on improving an estate, he could not, without the previous consent of the tenant, recover, as rent, interest on the capital sunk, excepting through the Courts. On the other hand, if a tenant desires to improve his holding by erecting a house; digging a tank, etc., he has to pay *salami* to the zamindar.

Thus there is discouragement to both landlord and tenant against introducing improvements.

QUESTION 25.—WELFARE OF RURAL POPULATION.—(*a*) Pure water-supply; better medical attention; sanitation are all necessary. In most parts of Bengal, the tube well offers a sure method of obtaining good and pure water.

(*b*) Investigations of the kind are already in progress. It is probably impossible to obtain a complete economic picture of a village in a short time. Probably the survey should be a normal part of the work of the District Magistrate's staff, which should be increased for the purpose, if necessary, and which should be assisted by other departments wherever possible.

(*c*) No intensive economic enquiries had been commenced until recently; but under instructions all District Agricultural Officers will investigate one or two villages in their respective districts as part of their training. Generally it is considered that a Board of Economic Enquiry should be set up in Bengal on the lines of that working in the Punjab. This should not be an official Board but should embrace all sections of the community interested in social welfare. It should be subsidised by Government.

QUESTION 26.—STATISTICS.—Excepting that for jute, the forecasts for all other crops are compiled entirely from information received from the Collectors. It is to be admitted that the source of this information is generally unreliable, being originally, at the bottom, the village *chowkidar*.

The chief characteristic of the *chowkidar*, as indicated in the forecasts, is his pessimism; for according to him the production of many crops appears to be on the decrease, and it has recently been necessary to initiate enquiries with the object of ascertaining whether the land is really becoming less fertile, and yielding less produce, or whether the alleged decrease is not in the imagination of the reporters.

The difficulty with all crops excepting jute is that there is no commercial check. With jute, however, in an ordinary year, the imports into Calcutta, which are accurately known,

* See Questions 18061-18064 on page 41.

form an excellent check. The jute forecast is compiled differently from other forecasts, largely on account of this check. The Presidents of panchayats are in charge of the operation for their respective jurisdictions; and under recent orders Circle Officers check the returns of the panchayats. These returns are eventually reported through Sub-divisional Officers to the Collector who forwards them to the Director of Agriculture. Officers of the Agricultural Department assist wherever possible in checking the returns and in compiling them at headquarters.

The conservatism referred to above regarding statistics for other crops is also characteristic of the reports regarding jute and this tendency has to be continually corrected in compiling the forecast. Fortunately independent commercial estimates of the jute crop are always at the disposal of the Director, which is a great help.

Generally it may be said that in a tract which has been cadastrally surveyed, the area under any crop could be calculated correct to an acre, by means of the survey maps, if the staff available is large enough. Similarly in cutting-out experiments, for estimating the average yield, an accurate result would be obtained by so large a staff. The expense of such a staff would however probably be prohibitive.

Some jute firms make comparatively accurate forecasts, not by estimating the area in absolute figures, but by comparing the present year with the previous one. This estimate is done by employees, who have been stationed in their respective tracts for years, and who know almost instructively, from the appearance of the crop, as it is on the land, approximately how much more, or less, it is than in the previous year. Their observations are, however, supported and amplified by detailed enquiries in the neighbourhood. In this way, from a large number of typical centres, the head office of the firm receives a series of nearly accurate comparisons which enable it to make a correspondingly accurate total estimate.

The use of the aeroplane in forecasts has been suggested and is worth consideration. The utility would of course depend on ability to recognise a particular crop from a photograph. This should not be difficult with jute, which stands out so prominently among the surrounding paddy. Moreover, in Bengal high-growing crops like jute are comparatively rare.

The accuracy of crop forecasts is obviously an important matter, not only for the commercial world but for the cultivator. The situation, however, appears to be one-sided as regards the cultivator and possibly even as regards the manufacturer. It was suggested, at a recent meeting in Faridpur, that a forecast of consumption should be made, and reported to the cultivator, so that he could adjust the respective areas of the crops he grows. There is a very definite tendency for the jute cultivator to organise himself just now, and if his co-operative sale societies succeed, there seems no reason why, ultimately, representatives of producers, manufacturers and consumers should not arrange matters between themselves for the good of all concerned.

In any case the more the cultivator becomes a definite organised body the better the chance of such a desirable contingency arising.

(*a*) (*iii*) A livestock census has just been published in Bengal.

(*a*) (*iv*) This would best be done by the District Magistrate, not as an intensive enquiry in a short time but as a routine portion of the duties of his staff.

(*a*) (*v*) *Vide* above.

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Oral Evidence

17511. *The Chairman:* Mr. Finlow, you are Director of Agriculture in the Presidency of Bengal?—Yes.

17512. Mr. McLean, you are Assistant Director of Agriculture in this Presidency?—Yes.

17513. You two gentlemen have written up for the Commission a joint note of the evidence which you propose to give. Mr. Finlow, do you wish to make a supplementary statement at this stage, or shall I proceed to ask you a few questions?—I do not think I shall make a supplementary statement at this stage. There is only one thing I would like to say, and that is, in regard to some questions like agricultural indebtedness and fragmentation of holdings; we do not consider that we have enough information at our disposal to make our evidence on these subjects of very much value to the Commission.

17514. I take it, Mr. McLean, that you do not desire to make any statement at this stage?—No.

17515. My colleagues are greatly obliged to both of you gentlemen for the note which you have handed in and also for the file of memoranda for which I know you, Mr. Finlow, and Mr. McLean are also responsible; I take it that is to be read in conjunction with the note of evidence you have handed in?—Some of it was sent in as confidential, for instance, the Annual Report of the Department of Agriculture for the last year (1925-26). That has not yet been published; it is confidential.

17516. That is so; we have noted it?—There is also a note taken from a file which is also confidential.

17517. Are any of the notes that are confidential printed in this book? Perhaps you will let us know later which notes are confidential?—Yes.

17518. Mr. Finlow, would you tell the Commission what your own training and past appointments have been?—In 1897, I left Sandbach School in Cheshire and proceeded to the University College at Bangor with a scholarship to join the agricultural side there. I pursued the agricultural course in Bangor for two years, took the diploma and proceeded to take a degree in pure science in the University of Wales. After graduating, I was appointed private assistant to Sir James Dobbie and Sir Walter Hartley for spectroscopic research into organic compounds. I did that work for the inside of a year; then I was transferred to the chemical staff of the Royal Commission on Sewage Disposal on which Sir William Ramsay was the chemical member and Dr. McGowen chief of the chemical staff. The work for the Royal Commission consisted of a great variety of chemical work and also the investigation of the physical composition of soils with regard to their nitrifying properties. This occupied me for three years until 1903. In the meantime I was also asked to do work for the Royal Commission on Arsenic Poisoning, which also involved considerable chemical investigation. In 1903 at the instance of Sir William Ramsay I came to Bihar under the Bihar Indigo Planters' Syndicate. The appointment was only for nine months, and I was supposed to return to London in 1904, but just at that time the Department of Agriculture was being organised in India, and I was asked to become a member, which I did. My first work in the department was in connection with jute, and, to a certain extent, indigo. Actually the first investigation which I carried out was with a view to making a legal standard to prevent fraudulent watering of jute fibre. From that we went on to attempt to improve the yield of jute, and, in collaboration first of all with Mr. Burkill, I commenced a survey of the races of jute in Bengal; the report on that is published. Then the survey having been completed we commenced pure line selection. The result of that work is now in evidence. It took about seven or eight years to make comparisons and get the seed multiplied in sufficient quantity to get it to the cultivator. During that time a good deal of other work was done; apart altogether from the selection work there were experiments in connection with manure and the general methods of cultivation of jute, such as cropping and rotation. In 1919 I acted as Director of Agriculture when Mr. Evans was at Home. In 1920 Mr. Evans became Director of Agriculture for two years and in 1922 I succeeded Mr. Evans as substantive Director of Agriculture.

17519. How do you divide your work between yourself and your Assistant Director of Agriculture?—Under the arrangement the idea is that when the Director is a scientific man, a man of largely scientific training, the Assistant Director shall be a man on the general side, and *vice versa*. Of course the division is not exact by any means, because naturally both have to do a great deal of inspection work. Generally, if a scientific question comes up I deal with it, while inspection and work on the general side is shared between us.

17520. Is Mr. McLean in charge of propaganda ?—Yes.

17521. Mr. McLean, may we have from you briefly what your own training has been and which posts you held ?—I took my degree in Agriculture in Edinburgh, and went to Ontario to work under the Canadian Government for one year. I returned and did the larger part of a year with the Valuation Department at Home. I got this appointment in India in 1914, and I was Deputy Director of Agriculture, Eastern Circle, Bengal. Between 1916 and 1919 I was in the Army, and then I returned as Deputy Director. When Mr. Finlow became Director, I became the Fibre Expert and last year I was made Assistant Director.

17522. We shall assume that you, gentlemen, agree with each other in any answer given by the other unless you say something to the contrary ?—Yes.

17523. I shall address myself mainly to you, Mr. Finlow, as Director of Agriculture. You have provided the Commission in various documents with some account of the organisation of your staff both at the headquarters and throughout the Presidency?—Yes.

17524. I should like at this stage to make quite certain that the matter is clear. Are the terms "Assistant Director" and "Deputy Director" synonymous ?—No.

17525. Then who are your Deputy Directors ?—There are three Deputy Directors, Mr. Smith, Mr. Sarkar (who is officiating as Deputy Director in the vacancy created by the death, last week, of Rai Bahadur Rajeswar Das Gupta) and Mr. Malik from the Punjab who has also been appointed to officiate.

17526. I see from these notes that your Deputy Directors are mainly concerned with the management of farms and field experiments. Is that so ?—Yes, and also propaganda in the districts.

17527. Next below your Deputy Directors in the organisation come your Superintendents ?—Yes.

17528. They are in charge of Commissioner's Divisions; is that so ?—Well, that has rather been altered since the retrenchment took effect. The original idea in appointing Superintendents was that they should have charge of Commissioner's Divisions under the Deputy Director of Agriculture. But after retrenchment there were not sufficient to go round.

17529. Would you tell the Commission how they are disposed at the moment ?—At the present moment some of them are officiating in the Imperial Service; one Mr. Dutt is officiating as Second Botanist; two as Superintendents of Sericulture; two of them are attached on special duty at the present moment, one on tobacco and the other on sugarcane.

17530. How many Commissioner's Divisions are there in this Presidency ?—Five.

17531. And in fact how many Superintendents do you have in charge of Commissioner's Divisions ?—There is none at the present moment. This note was written a few months ago.

17532. Do you think there is anything more up-to-date than you have provided us with ?—I do not think so.

17533. I would like to ask you whether you aim at restoring this grade in your organisation ?—I do not think we do. What we would like to do is to have Deputy Directors of Agriculture in every Division rather than Superintendents. That is what we were aiming at before the retrenchment took place.

17534. The next step is the District Agricultural Officers; what grade of officers hold these posts ?—They are of the Upper Subordinate Service.

17535. Then, last of all your demonstrators ?—Yes.

17536. What grade are they ?—Of the Lower Subordinate Service.

17537. What stamp of men do you get for your District Agricultural Officers ?—So far, most of them have been trained at the Agricultural College at Sabour in Bihar. Some of them were trained at other colleges in India, one at Poona and one or two at Nagpur. But the majority of them are Sabour men.

17538. Are they countrymen or townsmen mostly ?—I am afraid I cannot say.

17539. Are they efficient ?—Not too efficient, especially immediately after the course which was not sufficient. It was only a two years' course; the entrance examination was matriculation, and there was not sufficient time to train them in the two years. To produce very good men and in order to make them efficient it was necessary to give them further training.

17540. What about their prospects ?—At the present moment their pay is from Rs. 125 rising to Rs. 300 with a possibility, for a few of them, of getting into the provincial grade.

17541. Would you desire to see their prospects extended ?—I think the District Agricultural Officer is the most important officer in the whole of the propaganda organisation. I think he is the crux of the whole problem. I should like to see the prospects of the District Agricultural Officer such that the service would attract as good men as are going to any of the other services of Government.

17542. Have you commenced recruiting for the Superior Provincial Service in accordance with the recommendations of the Lee Commission ?—No. The rules have not been finally approved by Government yet.

17543. In order to open the road to such of these District Agricultural Officers as are worthy of promotion, what steps would be necessary to be taken ?—Do you mean in regard to their prospects ?

17544. Yes ?—A proposal would have to be made to Government to better their prospects.

17545. Have you any definite scheme worked out ?—Not for anything better; we have just brought their prospects to the present stage, which I have described.

17546. Then as regards your demonstrators, what training do they get ?—The original demonstrators had only the training which we could give them in one year on the Dacca farm or on any other big farm like Rangpur or Chinsura.

17547. Chinsura school having now been closed ?—Yes.

17548. The farm is still open ?—Yes; the farm still exists.

17549. Are most of these demonstrators men who, as boys, had been through the Dacca Agricultural School ?—No; they were appointed some years before the Dacca school was established. But now before we appoint any new demonstrators of course we do insist on the school qualification.

17550. Are these demonstrators satisfactory ?—Some of them are, but as a body they are not entirely satisfactory. I mean their training is not sufficient.

17551. In what respect, technically ?—Yes; it is really a question of knowledge and their being able to influence the cultivators in their immediate neighbourhood; but we are training them, taking them into the Dacca farm at the rate of 10 or 12 per year and putting them through the school course; they will be very much better men afterwards.

17552. How about their knowledge of the managerial and commercial side of the agriculture ? Do you think it is important ?—You mean on the part of the demonstrators ?

17553. I do ?—I do not think they know much about it.

17554. Would you agree that advice given by a demonstrator who understands the commercial side of farming is likely to be more palatable to the cultivator than advice given to him by one who is a technician and nothing else ?—It all depends on the personality of the demonstrator.

17555. But if the demonstrator happens to talk nonsense about the commercial side of the cultivator's business, it is not likely to enhance the cultivator's confidence in the demonstrator's knowledge of agriculture as a whole, is it not ?—No; but so far in the popularisation of improved seed the demonstrator has not had much chance of going wrong, and in the meantime he is gaining practical experience at the Government farm in the district to which he is posted.

17556. Have you any system of attaching demonstrators to a farm conducted on economic lines ?—All demonstrators are attached to farms in which an area is set aside to be cultivated on a commercial basis and on economic lines.

17557. With costings or without ?—With costings.

17558. Is it your experience that demonstrators do in fact leave those farms with a sound general knowledge of the management side of farming and the commercial side of marketing ?—It is difficult to go so far as that; but it certainly improves their knowledge a great deal.

17559. How long are they on these farms ?—They are more or less permanently attached to the farms until they are sent out to particular tracts where their services are needed.

17560. That, I think, concludes your organisation in the Presidency itself ?—Yes.

17561. Now as regards your headquarters and research, are these concentrated mainly at Dacca ?—Yes.

17562. Your rice centre is at Chinsura, is it not ?—There is a good deal of work on rice at Chinsura but Dacca is the headquarters for rice too.

17563. For everything, is it ?—Yes.

17564. There you have under your own direction your Economic Botanist, Chemist, Fibre Expert, Entomologist and Mycologist ?—The men holding the posts of Entomologist and Mycologist are only assistants ; they are not men of the Imperial or of the Provincial Service ; they are both men in the subordinate service.

17565. Are they graduates ?—One is a graduate and the other is not. They both were trained at Pusa.

17566. Your Economic Botanist ?—The Economic Botanist is Dr. Hector.

17567. Your Fibre Expert ?—Mr. McLean at present does the work of Fibre Expert.

17568. And your Agricultural Chemist ?—The Agricultural Chemist is Mr. Carbery.

17569. And do these posts make up the whole of your staff ?—There is a second Economic Botanist.

17570. Then you have a certain amount of work going on at Chinsura which includes work on rice ?—Yes.

17571. Anything on cattle ?—Nothing on cattle at Chinsura.

17572. What else at Chinsura ?—Rice, sugarcane, jute and a certain amount of work on oil-seeds and pulses and other crops. There is also some work on cotton but it is not very important.

17573. Not much work on cotton ?—No.

17574. Have you a farm in every district ?—Not yet.

17575. That is what you are aiming at ?—Yes ; we have them in 20 districts ; in some districts there are more than one farm, for instance, in Rangpur there are three.

17576. *Sir Henry Lawrence :* Twenty out of how many ?—Twenty out of 27 districts ; I should mention that there are proposals for the establishment of two more farms which will make 22 farms in 27 districts.

17577. *Professor Gangulee :* These are all experimental farms ?—No ; they are partly experimental and partly demonstration farms.

17578. *The Chairman :* Have you any European officers on short-term contracts ?—No.

17579. Have you any experience of that ?—No.

17580. On the first page of your note you say, " Irrigation may prove to be the crucial factor in deciding whether Bengal shall make an appreciably larger advance in agricultural prosperity than would otherwise be the case. " Are you suggesting there that your department, the Agricultural Department, should make an investigation and carry on research or are you willing to leave that to the Irrigation Department ?—This point has been raised before Government and it was decided that the Irrigation Department should take charge of irrigation works which involve flow irrigation ; but the supply of water from a well, for instance, or from a tube-well, would be work which we should undertake, in the first instance, as an experimental measure.

17581. At this stage I should like to ask you whether you have anything other than that which you have put in your note to tell the Royal Commission about Pusa, its usefulness to this Presidency or the reverse, the teaching there or anything else that may be appropriate. If you wish to give evidence on this question *in camera*, I shall clear the room at a later stage and give you an opportunity of speaking in private. If, on the other hand, you are prepared to speak in public, I hope you will ?—I have no objection to speaking in public.

17582. Are you satisfied with the work that Pusa is doing ?—Yes.

17583. What do you say about the prestige of Pusa ?—As far as we are concerned, it is high. I have worked at Pusa myself, I am familiar with the class of work which is being done there, and my opinion is that its standard is as high as it can well be.

17584. And as high as it has ever been ?—Yes.

17585. Are you satisfied that the central direction of research at Pusa is sufficiently definite ?—Yes, I have no other suggestions to make in that respect.

17586. Have you anything to say on the teaching side ?—I do not know much about it.

17587. You have nothing to say on that point ?—No.

17588. Mr. McLean, you will interpose any remarks or any points you wish to; both the witnesses are before the Commission. You are impressed, I gather from page 2 of your note, with the success of the work of the Indian Central Cotton Committee ?—Yes.

17589. And you argue from that that research in other agricultural matters might well be organised, crop by crop ?—Yes.

17590. What are the crops which you suggest might be organised in that fashion ?—Jute is one.

17591. Any others ?—Pulses and oil-seeds and possibly, I am not sure, paddy.

17592. Any other fibre crop ?—There is no other fibre crop ; of course there is hemp, but the work on that could probably be carried on by the same committee which would work on jute ; and apart from cotton, the amount of other fibres grown in the country is comparatively small.

17593. Any other crops ?—I cannot think of any at the moment except tobacco.

17594. To some extent, some of those crops are organised, are they not ?—Sugarcane is of course organised ; there is the Sugar Bureau.

17595. I think we have the full particulars, but I want to put to you a question or two on this matter of financing these organisations. In the case of cotton it is a cess ?—Yes.

17596. And in the case of a crop, the greater part of which is exported, no doubt the cess offers an easy and fair way of financing the organisation?—Yes.

17597. Do you think it would be fair to finance agricultural research generally on a cess levied on agricultural produce which is exported ?—I think it might come on different Provinces with very different weight.

17598. You would have the grower of crops for export paying, however little, for work on his neighbour's crop, which is not to be exported and which is paying no cess ?—Yes. The incidence of it is very small, but if the whole of it fell on one particular Province, it would be hard.

17599. How would you view an acreage cess ; will it affect definitely agricultural development ?—At first sight, it is difficult to express an opinion ; I have not considered the point at all. It seems to me to be the fairest way of all. Of course, I am not quite sure what administrative difficulties might be met with. It seems to me that it ought to be fairly easy to collect the cess with the land revenue, so many pies in the rupee or proposals of that nature, such as have already been made in Bengal for getting rid of the water-hyacinth. There is an export tax on jute of Rs. 4-8-0 a bale ; that money is used by the Central Government for things other than agriculture, it is not spent on agriculture.

17600. Does that go to the general revenues ?—Yes.

17601. *Dr. Hyder :* You have a local cess also ?—Yes, there is a cess of 2 annas per bale which goes to the Calcutta Improvement Trust.

17602. *The Chairman :* What is the scope of the Calcutta Improvement Trust in regard to agriculture ?—It has nothing to do with agriculture.

17603. *Sir Henry Lawrence :* Is the cess on bales imported into or exported from Calcutta ?—It is on bales exported.

17604. *The Chairman :* I gather from your joint memorandum that you, gentlemen, are, broadly speaking, in favour of a good deal of research being carried on under the Imperial Government ; is that so ?—Yes, I think the Central Government can do a great deal to assist research in the Provinces.

17605. Have you in mind that the Central Government should attack problems of fundamental importance and of general application, and that provincial research should always be left to work out the application to the particular conditions in the particular Province ?—Yes.

17606. How would you view the setting up of some Central Advisory Body or Development Commission, which would be at the disposal of Provinces who wish to seek their advice, which would have available the knowledge of all the work being carried on in other Provinces and in the Central Institution, and which may have at its disposal certain funds which might be allocated, perhaps on a percentage basis, to Provinces carrying on

research work, on condition that that work was co-ordinated with other work in other Provinces and with the Central Government research station ?—I think it will do good.

17607. A body with representation of course from the Provinces upon it ?—Yes, certainly.

17608. The central body might conceivably initiate some wide policy of research on some particular problem, but, in the main, the initiative would probably lie with the Provinces, who would put up a scheme and ask for advice and for a financial blessing ?—That is what I think would probably happen.

17609. I take it that you accept the permanency of the provincialisation and the transfer of Agriculture ?—Yes.

17610. So that, you would agree with me that any scheme of the sort that I have outlined, which did not commend itself to the Provincial Government or Administration would be doomed to failure ?—Yes, of course.

17611. It is necessary that any such scheme should be attractive to the Provinces, if it is to be effective ?—Exactly.

17612. You would not, I assume, favour any centralisation of executive authority in matters of research; you would leave the Provinces to their own masters in every respect ?—Most decidedly; I would never dream of taking research away from the Provinces.

17613. Have you any notions in that direction which you care to lay before the Commission; would you like to develop the idea of a central body in any way ?—No.

17614. Perhaps I may ask you whether, in your experience, there is lack of co-ordination at this moment ?—I think probably there is a good deal of work which is being done in different Provinces, on crops, for instance, or perhaps on manure, or any other line of work which an Agricultural Department engages in, and in which most people are concerned. One is not thoroughly familiar with the work which is being done in other Provinces. One may be able to see the Annual Reports; but that is not sufficient; what we want is closer co-ordination of the work.

17615. Are you yourself engaged in any research at this moment ?—No.

17616. What is the most important piece of research work being carried on under your instructions ?—Plant breeding, with jute, rice, tobacco, cotton, the manurial requirements of crops and there is the question of water-supply for paddy and other crops.

17617. Are you aware what is being done on that particular problem in the Presidency of Madras at this moment ?—No, I do not think I am thoroughly conversant with it. I cannot recall any paper from Madras that I have seen on the subject of transpiration.

17618. Broadly speaking, it is true to say that you yourself are not in touch with the research work that is being carried on in Madras ?—On the whole, I think one ought to say that; one reads the Annual Reports of course, but one has not the necessary amount of information which one should have.

17619. *Professor Gangulee:* Does your experiment refer to water-supply of paddy or water requirements of paddy ?—It refers to water requirements of paddy.

17620. *The Chairman:* Have you any famine areas, so-called, in this Presidency ?—Not in the real sense of the word.

17621. Do you use the term ?—The term "famine" is used in Bengal occasionally, but it refers to Western Bengal really, which is a rolling country.

17622. Is it an unirrigated area ?—Yes, it is merely when the rains fail that famine occurs there.

17623. Is this area unirrigated either by canals or wells ?—There is a certain amount of irrigation from tanks.

17624. What work is your station at Dacca doing in the direction of cultivation experiments, designed to assist the cultivators in the dry areas; are you doing any work of that nature ?—The district farms at Suri (Birbhum district) and at Bankura have been established with this object in view and good progress is being made.

17625. Are you making any contribution towards the problem of agriculture in the dry areas ?—Yes.

17626. What contribution are you making ?—We have farms in two out of the three principal districts, and we are experimenting with a number of crops of different varieties for that tract.

17627. Do you think the dry areas have had a fair share of your attention ?—In the beginning, as far as we were concerned, they were in a different Province; we started work

in Eastern Bengal, but latterly a great deal of attention has been given to Western Bengal.

17628. What size is the average holding in these dry areas ?—I do not think I have got any exact figures for that.

17629. Are they small holdings ?—They are not big, but I would not like to give a figure ; I could get the figures for you.

17630. Would you agree that no class of cultivator is more deserving of attention and assistance than the small man in the dry area ?—Yes, I think so.

17631. That is where poverty is felt most severely, is it not ?—Yes, that is true.

17632. And the uncertainty of the season falls on them with greater severity ?—Yes.

17633. And, in the light of these views, you do feel that at this moment these people are receiving a fair share of your attention ?—I think so. On these farms, we have posted the most experienced men we have, and very special attention is being given to all the crops which it is possible to tackle as well as to manures and cultivation.

17634. Is cultivation proper improving ?—What we are doing is to see how far the various lands of the rolling country can be utilised for other crops than paddy. That is the main object of our work, and the results appear to be very encouraging indeed.

17635. How about the practice of ploughing ? Is that satisfactory in the districts?—In Western Bengal they use the ordinary plough.

17636. Are they ploughing often enough ? Has that problem been demonstrated and taught to the villagers ?—We have not gone far enough to demonstrate fully any particular line of work at the present moment. We should say that we are dealing with monsoon cultivation, pure and simple, and the operations for a month or two succeeding the monsoon. Perhaps you are thinking of arid tracts ?

17637. I was concerned to discover from you what the problem was ?—The problem is monsoon cultivation.

17638. Is the practice of cultivation and the method of handling and tilling the soil of great importance in that particular area (Western Bengal) ?—They must be.

17639. Is the indigenous practice sound ?—The ordinary plough is all that they have at present in the way of implements. We are seeing if we can improve it.

17640. Would it be fair to say that, although it is your view that a fair share of your charge is being at this moment directed towards these particular problems, you are only at the beginning of your work in that direction ?—Yes ; we have not at the present moment got any results which we can apply on a very large scale.

17641. *Professor Gangulee :* You have just said that you have experienced men in charge of Western Bengal. Who are they ?—They are Rajnath Babu and Chuni Babu. Both of them are very senior men.

17642. *The Chairman :* With regard to agricultural education, is any agricultural work carried on at the Calcutta University ?—I would ask Professor Gangulee to reply to that question.

17643. You do not know ?—No, I do not know.

17644. Are you training any post-graduate men in research work at Dacca ?—No.

17645. So that you have no views to lay before the Commission as to the standard of efficiency attained by the graduates of the Calcutta University ?—No.

17646. Have you any Indian research workers at Dacca ?—Yes.

17647. Where were they trained for the most part ?—They came from Calcutta. Some of them have also come from Dacca.

17648. Are they graduates of the University of Calcutta ?—Yes.

17649. What do you say about their attainments when they come to you ?—The men with the Honours degree are quite good.

17650. Are they good enough for higher research work ?—They require training in research ; they have a good equipment.

17651. You are satisfied with their attainments when they come to you ?—I think we can say so.

17652. *Dr. Hyder :* Do you get any men from the University of Dacca ?—Our staff is full. It was recruited before the Dacca University supplied graduates.

17653. *Professor Gangulee:* What is the nature of the research work that these young men are doing ? Is it botanical research or chemical research ?—It is botanical, chemical and bacteriological research.

17654. *The Chairman:* What about the training of Indians abroad ? Do you believe that Indians should leave this country as young men to be trained in Europe, or that their training in their earlier years should be entirely in India ?—If you want to produce a specialist, a man with a special knowledge of a particular subject, I should say that the soundest thing would be to send him wherever the best man is stationed.

17655. Go for the best teaching wherever it is ?—Yes.

17656. At what stage would you send him to that teaching ?—It is very difficult to say. The ordinary procedure would be for a student to graduate first; then, possibly, even take a post-graduate course and then go to Europe.

17657. So that he would probably be five and twenty before he went to Europe ?—Yes.

17658. That, in your view, is quite early enough in life ?—Yes.

17659. On page 3 of your note you say, "There is therefore reason for believing that a preliminary training in pure science, followed by two years' practical work at the Dacca farm, is capable of producing a reasonably efficient District Agricultural Officer." Where do you suggest the preliminary training in pure science should be given ?—It might be at any suitable College or University.

17660. Then you pass on and mention the scheme for the Dacca Agricultural Institute. Has that scheme ever been given effect to ?—It has been before the Government for a number of years but it has not matured simply because of lack of funds.

17661. *Professor Gangulee:* For how many years has that scheme been before the Government ?—It was originally brought forward in 1919. At that time there was available a grant from the Government of India but it was withdrawn before the scheme could be put into operation.

17662. *The Chairman:* A word or two about the secondary agricultural school at Dacca. Is that school getting boys from all over the Presidency ?—The school is advertised all over the Presidency.

17663. Are the boys, in fact, coming from all over the Presidency ?—I cannot say exactly where they are coming from. (*Mr. McLean.*) All the applications this year came from Eastern Bengal and Northern Bengal.

17664. Are they sons of cultivators or sons of townsmen ?—About half and half; but they are not sons of townsmen but sons of the *bhadralog.*

17665. What is your definition of *bhadralog* ?—People who will not do manual work.

17666. *Dr. Hyder:* And these are the people who go to the agricultural school ?—We had applications from them.

17667. *The Chairman:* Have you any control over or touch with this school at Dacca ?—Yes.

17668. Do you control the syllabus ?—Yes.

17669. I take it that English is the medium of teaching ?—No; it is vernacular.

17670. It is a vernacular school entirely ?—Yes.

17671. A certain number of the boys, as you have pointed out in your memorandum, go back to agriculture as a profession ?—Yes, I have given the figures in my notes.

17672. Is no English taught at that school at all ?—No; all the lectures are delivered in Bengalee.

17673. So that none of those boys can find their way to the Universities ?—Some of them do speak English.

17674. Where do they learn it ?—At the high school. Some of them have read up to the Matriculation standard.

17675. Do you keep up their English at all ?—No.

17676. They have to do that themselves ?—Yes.

17677. On page 3 you say, "For the agricultural classes in middle and high schools the farm of upto 5 acres must be preferable to a school garden." Does not the problem of farm management arise on a holding of 5 acres ?—The 5 acres was decided on as being a suitable area for a pair of bullocks.

17678. Does not the problem of farm management on a holding of that size arise ?—Yes, certainly.

17679. Who is going to provide the management ?—It will have to be in charge of a teacher.

17680. Do you think it is likely that the teacher, who in your view as expressed in this memorandum, can hardly cope with the teaching of nature study, will make a success of the farm management of a 5-acre holding ?—He is a different type of man from one who teaches nature study in the primary school; and he will be constantly supervised.

17681. You think you can provide sufficient knowledge of management and I suppose also of marketing, namely, the commercial side, because you contemplate marketing the produce, do you not ?—Yes.

17682. From amongst the school teachers in middle and high schools ?—Yes.

17683. You think that can be done ?—Yes.

17684. In answer to Question 2 you really cover the whole of our question on General Education and so I will deal with it now. You have in mind, I observe, that as regards primary education literacy is the first objective ?—Yes.

17685. You do not think that it is worth while turning aside to attempt to teach agricultural practice or the vocation of agriculture to small children ?—No.

17686. How much nature study, do you think of a useful kind is likely to be given by the average teacher in these elementary schools ?—So far it has been very disappointing.

17687. On the question of literacy, I take it that it is the case in this Presidency as elsewhere in India that literacy is only attained by a small proportion of those who join the lowest classes; the leakage is considerable ?—I think that is the case.

17688. You are probably in agreement with me that literacy, if it could be attained by an important proportion of the rural population, would make your work of administration and of the general improvement of agriculture a great deal easier ?—Yes; think so.

17689. So, the question of literacy is very important from the agricultural angle ?—I think so.

17690. Have you any suggestions to make whereby the percentage of literates in the rural population might be increased ?—It is a tremendous problem. I have discussed this question with the provincial educational officers. I think you have with you a note by Mr. Michael West, Principal of the Dacca Training College, in which he expresses the view that there are too many primary schools at the present time to allow of efficient teaching. He points out that in Bankura district there are 11½ primary schools to a square mile. He advocates that the schools should be reduced in number and increased in capacity; so that they may have correspondingly more, and better paid masters, who will not have to teach several classes at once.

17691. Apart from the fact that there are large numbers of boys going to the primary school and leaving before they attain complete literacy, there is considerable relapse to illiteracy among those who attain it ?—That seems to be doubted. If a boy once attains literacy he will retain it, but if he has not attained a sufficient standard of literacy, he cannot carry on after he leaves school, and so he relapses.

17692. Have you anything to say about female education or adult education in night schools ?—No.

17693. On page 4, paragraph (x) in answer to our Question 2 (i) and (ii) you say, "The introduction of agriculture into the ordinary educational system will tend in this direction," (that is, to turn the boy's mind to the profession of agriculture) "especially as it becomes more and more realised that the openings for boys with purely literary education are limited." Is that a pious expression of your hopes or is it founded upon experience ? Have they begun at all to realise it ?—They certainly are realising now that the openings for boys with a purely literary education are limited.

17694. Do you see any reason to suppose that any considerable number of boys are deliberately turning from the path that leads to University education and a degree in order to take up other work ?—Agriculture would be the next thing they would turn to as most of them are connected with agricultural families.

17695. That is what many of us would like. But I am trying to get from you whether you observe any tendency in this direction at this moment ?—Agriculture has not yet been introduced into the schools.

17696. Do you observe any tendency on the part of the educated class in this Presidency to realise that the careers open to graduates, whether those careers are official or not, are limited in number and that other avocations in life are just as honourable, and some of them more remunerative and more worth aiming at ? Do you see any tendency in that direction ?—I think there is ; I know of instances.

17697. *Dr. Hyder :* Is there any diminution in the number of people who pass out of the University of Calcutta after taking a degree in the Arts course ?—I cannot say.

17698. *Professor Gangulee :* Do you have in mind the introduction of agriculture into the ordinary educational system ? What actually have you in mind ?—What I have in mind is what is known as the Punjab scheme.

17699. Giving a sort of agricultural bias by introducing a text-book on agriculture, and things of that sort ?—It is a complete scheme the main object of which is to give the boy practical ideas, which the present purely literary system fails to do. Moreover, if in any degree successful, it must not only familiarise the student with the fact that there is such a thing as improved agriculture but also, in the great majority of cases, cause him to assimilate a number of valuable ideas.

17700. *The Chairman :* I see that from the Dacca school, out of 45 students whose whereabouts are known, 25 are engaged more or less directly in agriculture ?—Yes.

17701. That is a very small proportion ; is it not ?—There were very few students after the first two years. As soon as we stopped recruiting demonstrators from boys trained there, the number of students dropped.

17702. It does not look as if agriculture on a commercial basis is what most of these boys have in mind when they go to school ?—No.

17703. At the end of the section on agricultural education you say that, in order to get over the difficulty of persuading boys who have had agricultural education to go back to agriculture, it has been suggested that, instead of one whole year of training at a farm or nursery in one period, you might have two periods of six months each, at an appreciable interval from each other. Do you agree with that idea ?—We have no experience at present ; it is only a suggestion, and it relates to boys who go to sericultural nurseries.

17704. One thing that strikes me in reading through this note is you do not say anything about the need for an agricultural college in this Presidency. Do you wish to say anything on that point ?—We have mentioned an agricultural institute.

17705. Is that in fact an agricultural college ?—Yes.

17706. Do you press for that ?—Yes.

17707. You want that ?—It has been discussed throughout the whole of last year.

17708. You have put a great deal of matter before us, I may have missed something. Have you put in any definite statement as to what the scheme is ?—A scheme has been put up to you which includes Mr. McLean's estimates.

17709. Very well, I will not ask you any question on that beyond this. Is it your suggestion that that agricultural college or institute should be linked to the University of Calcutta for the purposes of degree giving ?—At present there is an arrangement with the Dacca University.

17710. With the Dacca University only ? Not with both the Universities ?—There is no arrangement with the Calcutta University. The Dacca University takes the boy after he passes the Intermediate Science and after he has been accepted as a candidate they give them an extra year in pure science and then he comes on to the Institute for purely practical training.

17711. There is a great deal of scientific research and scientific teaching going on in the Universities which might to some extent be incorporated with the life of the agricultural college as such ; is that not so ?—Yes, certainly.

17712. Do you contemplate getting lecturers from the University to lecture to the students of the agricultural college ?—It is not in the scheme, but I have no doubt that it will happen.

17713. What is the standing of the Dacca University as compared with the Calcutta University, in your own judgment ?—I do not like to say. I know very good work in chemistry is being done at Dacca and also of course in Calcutta. I think it would be impossible to express an opinion.

17714. What is the origin of the University of Dacca ? How comes it to be there ?—It was established immediately after the re-partition of Bengal.

17715. Does it strike you as a flourishing and live institution ?—There are a very large number of students.

17716. *Dr. Hyder :* Was it as a result of the Calcutta University Commission's recommendations ? The Calcutta University Commission thought that the University of Calcutta was too unwieldy ?—I believe that is the case.

17717. *Professor Gangulee :* Have you any facility for research in botany ?—I take it that you are referring to the Dacca University. The botanical side is being established now. At the research station at Dacca, botanical research is of course one of the most important sections.

17718. It is not yet established ?—The Botanical Department in the Dacca University is not yet established.

17719. *The Chairman :* So much for that. I do not know whether you wish to amplify in any way what has been laid before the Commission ?—No.

17720. I turn then to Question 3, Demonstration and Propaganda. What type of demonstration do you find most effective, demonstration on plots controlled by the department or demonstration organised on cultivators' own holdings ?—Demonstration on cultivators' own holdings ; that is how you can get the cultivator to trust you.

17721. Demonstrations which are carried out on holdings entirely in the hands of the department are rather under suspicion ; are they not ?—Yes, sometimes, especially in the beginning ; but not after the cultivator realises that your work is sound.

17722. It is thought that the land owned by the department is better than the land owned by the cultivator and the department has large quantities of fertilisers and other mysterious agencies ?—Yes, but if the cultivator knows one and he sees his own type of rice or jute compared on a Government farm with a departmental type to the disadvantage of the former he draws his own conclusions. The suspicion of the cultivator as perfectly natural attitude in the beginning, is passing away.

17723. Are you developing your propaganda by means of demonstration on cultivators' own holdings ?—Yes.

17724. *Professor Gangulee :* What arrangement do you have with the cultivator when you demonstrate on his farm ?—If the crop is a failure, we pay the cost.

17725. You guarantee that ?—Yes.

17726. *The Chairman :* In the matter of seed distribution, I think the experiment which you have made of handing over the distribution of seeds to a gentleman, who, I suppose, is working on a commercial basis, is very interesting ?—He is working on a commercial basis.

17727. And I observe from the 1925-26 Report of the Department of Agriculture in this Presidency that the handing over of the distribution of jute seed only to this private person, Mr. Godden, has not in any way prevented the Indian Jute Mills Committee from extending a guarantee to Mr. Godden against loss ?—No.

17728. Do you think this idea of subsidising a private seedsman working on a commercial basis is capable of extension ?—With jute seed it is comparatively easy, but with rice it is rather difficult because of the bulky nature of the crop.

17729. Would you agree that one of the difficulties before the Agricultural Departments in India is the commercialisation of the sale of the seeds of improved varieties ?—Yes ; that is certainly a difficulty.

17730. There is a limit beyond which the State machine can hardly go in handling the seed for distribution ; is there not ?—Yes.

17731. And yet in ordinary districts the whole business of seed distribution on a commercial basis is in the hands of moneylenders ?—Yes ; that is ordinary bazar seeds.

17732. Are there any other commercial agencies available, so far as you can see, through which seeds of improved varieties might be distributed ?—The trouble at present is that the *bania* sells ordinary bazar seeds ; if you try to sell your departmental seeds through him it is impossible to control admixture, and the seed cannot be kept pure. We have already had considerable trouble based on the principle of imitation being the sincerest form of flattery, and it is doubtful, though I admit it has not been tried, if the *bania* would resist the temptation to mix departmental seed with inferior stuff.

17733. *Mr. Gupta:* Have you given a monopoly to this gentleman for the distribution of jute seed, or do you propose to extend that system by giving him a monopoly ?—I do not think so. There is no monopoly at present.

17734. Are you sure ?—I do not think there was any idea of a monopoly. The only idea of monopoly that came in at all was in order to protect ourselves and our seed. It was proposed that the position of agent for the sale of Government jute seed should be put up to auction like a ferry or a cattle "pound". I deliberately regretted the idea on the ground that, through malpractice, such a policy would inevitably result in ruining the reputation of Government seed. Of course, the demand from the cultivator would then vanish and so the whole object on account of which lakhs of public money have been spent on research would be defeated by unwise application of the results. I consider the present policy is the only reasonable one which could be decided on.

17735. *The Chairman:* Following on the last question, do you contemplate extending this plan as regards jute to other commercial persons or firms ?—Yes; there is not a monopoly in any way; but the conditions already laid down would have to be fulfilled.

17736. Have you any indications of the feeling of the public on this question ?—We had one or two men who enquired about it, but there have not been any other indications.

17737. You had no indications of public opinion since then about this work ?—I do not think so.

17738. In a critical sense ?—They were satisfied in most cases. The reputation of Government seed is as high as ever; which means that the cultivator himself endorses our policy. Other people do not matter.

17739. Are you using the co-operative organisation for the distribution of seeds ?—Yes, as far as possible.

17740. You find that works well ?—Where the co-operative societies are doing it, it has worked well. The results vary from district to district. There has been one very good instance in the Nadia district where the co-operative society took a very large quantity of seeds.

17741. Do you think that you are making full use of the co-operative organisations throughout the Presidency to carry out other forms of agricultural propaganda ?—We may be regarded as just commencing work of this kind.

17742. You are making a move in that direction ?—Yes.

17743. You find the leaders of the co-operative movement sympathetic ?—Yes, entirely.

17744. Are you trying propaganda by means of lantern lectures and cinemas ?—We have no cinemas; we have three lanterns for the whole of the Province; we hope to get a lantern for every district.

17745. Have you experimented with the cinema at all ?—No.

17746. You think there is a future before it ?—I think so.

17747. Have you any knowledge of the technique of film preparation ?—No.

17748. Would you take it from me that it is an extremely difficult and a very rare art ?—Yes.

17749. In view of that, would you look with favour on a bureau under the Government of India for the preparation of propaganda films to be at the disposal of the Provinces ?—Yes.

17750. You probably gather from the Press that the art where it exists commands a large price ?—Yes.

17751. And probably having shared the fate of most of us you know how bad a bad film can be ?—Yes.

17752. On the question of administration, I should like to ask you one question here of a general nature. How about your machinery, the machinery at your disposal for accumulating the records of past and possibly future experience ? Do you find that if you want to look up some subject on occasions, for instance, when peripatetic committees are worrying you, you have the information and the details of past experiments ready to hand ?—Not always. We have not got enough references; we generally refer to Pusa.

17753. I am thinking more of the accumulation and arrangement of experience, the result of experiments, and the result of administrative action; are they available to you at short notice ? Taking the question of silage, for instance, could you tell me the

history of every experiment conducted in this Presidency to popularise the practice of preserving fodder in silos ?—We are only aware of one.

17754. You think there have been others ? I only want to get from you whether you think that your apparatus or machine for recording experiments, recording administrative experience, is working well ?—It could certainly be improved.

17755. I suppose you as Director of Agriculture are responsible for preserving technical records, while the Secretariat is responsible for preserving records of administrative experience, is that so ?—Yes.

17756. Do you find that the Secretariat provides you easily and readily with facts of administrative experience ?—Yes.

17757. *Professor Gangulee :* Have you, for instance, the complete record of the work done by Mr. Blackwood when he was Director of Agriculture ? His attention was devoted largely to cattle-breeding and he started the Rangpur farm, did he not ?—Yes.

17758. Have you in your possession sufficient documents to show the nature of the problems he tackled?—You mean the reports ?

17759. A great deal of correspondence passed, when he was there, between him and the Imperial authorities on the question of cattle-breeding and so on ?—That is on record.

17760. *The Chairman :* Do you find that the administrative work that passed through your own hands is very considerable ?—There is a good deal, yes.

17761. Are you satisfied that your office is well-organised in that respect ?—Yes.

17762. Your attention is not required upon matters which might well be dealt with by an officer concerned urely with administration ?—No.

17763. You think in that respect you are all right ?—I think so.

17764. You have not been bothered by unnecessary administrative details ?—No.

17765. What have you got in that way in your office ? Have you a responsible officer concerned purely with administrative matters to whom you could delegate certain work ?—I do not quite understand what you mean by administrative matters.

17766. I take it that apart from the technical side, there is a great deal of routine administrative work which passes through your hands as the man responsible for organisation in agricultural matters throughout the Presidency ?—The Personal Assistant does the actual routine and the Assistant Director takes up the organisation with regard to the work of propaganda of the Presidency.

17767. You as skilled scientific officer and head of the technical department are responsible for research, are you not ?—Yes.

17768. And that requires a certain amount of time ?—Yes.

17769. And do you think that you are getting reasonable opportunity to devote yourself to that class of work ?—The correspondence is increasing to a large extent.

17770. *Sir Henry Lawrence :* What is the position of the Personal Assistant ?—He is in the Provincial Service.

17771. What is the pay ?—Rs. 400 to Rs. 600.

17772. *The Chairman :* One or two questions with regard to your answer to our Question 4 on Administration. First about railways, do you know anything about the Railway Advisory Council in this Presidency ?—No.

17773. Do you know anything about the channels through which complaints by cultivators or groups of cultivators can be made to the railway authorities ?—The only experience I have is as regards the complaints that pass through us, but as to what happens to the cultivator in general, I have no experience.

17774. Have the co-operative organisations made any complaint or suggestion to the railway authorities ?—I do not know.

17775. How about the railways in the Presidency from the agricultural point of view ? Are you satisfied with the numbers of branch and feeder lines provided and with the freight service generally ?—On the whole I think it is satisfactory ; I do not pretend to have any great knowledge of that subject. I know several new railways are projected.

17776. Do you ever as a department make representations to the railway authorities for special rates for particular agricultural products ?—Yes ; we get a concession with regard to seeds.

17777. Any easement in the matter of implements ?—The number of implements introduced has been so small that we have not done anything in that direction.

17778. But you do find the railway companies ready to listen to your suggestions ?—Yes.

17779. *Professor Gangulee :* With regard to manure what is the rate for oil-cakes ?—The normal goods rate.

17780. *The Chairman :* Have you anything to say on the condition of the roads ?—In Eastern Bengal the roads are substituted by waterways.

17781. But if we are going to talk about roads let us take the districts where they do exist. What about the roads in Western Bengal ?—There are good roads there.

17782. Are you satisfied with them ?—Yes.

17783. What about roads under the local authorities ?—They are not so good as the main roads.

17784. Are they better or worse than they used to be ?—I think on the whole they are worse.

17785. Are they bad enough to be a serious burden upon the agricultural industry ?—I do not think I am prepared to give an adequate general opinion on that.

17786. Have you in existence a system of toll gates ? Do you happen to know ?—The only toll is at the ferries over the rivers.

17787. Have you anything you wish to say as to the work of the Meteorological Department ? Are you getting from that department the services that you expect to get ?—We get all that we want.

17788. *Rai Bahadur Bannerji :* Is there any way of making the results of the Meteorological Department's work known to the common cultivators ?—The forecast of the weather can be made known to them by beat of drum.

17789. *The Chairman :* Is there any method existing at present ?—No, I do not think so.

17790. As regards post offices, have you any suggestions to offer ?—No.

17791. Would you agree that, from the agricultural angle, it is very important to encourage the cultivator to save money when he can ?—Yes.

17792. Do you think that the post office, from that point of view, is doing all that it can to popularise the system of savings banks administered by the post office ?—I do not think I have sufficient experience about it. During War time the system of cash certificates had good results.

17793. What are they doing now ?—I do not know.

17794. You cannot envisage the day when villages in this Presidency will have in them broadcasting receivers ?—I think it is a long way off.

17795. *Professor Gangulee :* Why do you think it is a long way off ?—It can be done. But there are other things on which money should be spent first.

17796. You will agree with me that it is a most useful weapon in your hands for demonstration and propaganda ?—Quite so.

17797. *The Chairman :* I should like to know whether you have at your disposal, and if so whether you will lay before the Commission, any statistics as to the debt of cultivators in this Presidency. Do you know the extent of the long-term and short-term debts, and the proportion of the long-term debt that is secured on mortgage ?—I have already said that we do not regard our evidence in that connection as being of very particular value.

17798. You have no statistics of the sort to lay before the Commission ?—No, but there are statistics to be found in the Settlement Reports of Backergunj, Faridpur and other districts.

17799. The mortgage debt may be ascertained from the reports of the Registration Department ?—Yes.

17800. But the fact is that there has not been a survey of this nature arranged, so as to make plain the extent of the debt of cultivators in this Presidency, whether to the Government or to moneylenders or to co-operative societies ?—I think that is true, excepting in the two districts that I have already mentioned.

17801. Do you think it would be a good thing, if an attempt is to be made to solve the very difficult problem of easing the load of debt, that some complete survey should be carried out ?—Yes, data would be necessary before anything could be done.

17802. Have you any land mortgage banks at work in this Presidency ?—No, I do not think so.

17803. Not as far as you know ?—No.

17804. Are you familiar with the working of the two Acts under which *taccavi* is made available in this Presidency ? I suppose it is done under the two Acts, the Agricultural Loans Act and the Land Improvements Act ?—Yes, but the Acts in question though capable of considerable use for the benefit of cultivators are practically only invoked when loans become necessary in times of distress. A third loan Act is the Agricultural and Sanitary Improvements Act which seems to be difficult to work.

17805. *Professor Gangulee :* Why is it difficult to work ?—The schemes are divided into two, major and minor schemes ; there seems to be difficulty in deciding which is a major scheme and which is a minor scheme and what the procedure shall be, and in general the Act seems to be too vague to be of great use.

17806. *The Chairman :* Have you yourself studied the question ?—My experience is confined to proposals to utilise the Acts, not to working them.

17807. *Rai Bahadur Bannerji :* You, as Director of Agriculture, have perhaps nothing to do with this. It is the Collector of the district who deals with it ?—Yes.

17808. Consequently, your experience in the matter is very limited ?—It is very small.

17809. *The Chairman :* That is no doubt so. Of course, before you attempt to popularise any improvement which costs money, you have to ask yourself where you are going to get the money from ?—Yes.

17810. To that extent you are directly concerned with the operation of the Act under which *taccavi* is made available in the country ?—Yes.

17811. What is this Agricultural and Sanitary Improvements Act ?—That is the Act I have been speaking about.

17812. I had better have it definitely from you. Under what other Acts is *taccavi* available to cultivators ?—The Agriculturists' Loans Act is the one for *taccavi* loans.

17813. What about the Land Improvements Act ?—Do you mean the Agricultural and Sanitary Improvements Act ?

17814. *Professor Gangulee :* It is the Land Improvements Act ?—The Agriculturists' Loans Act is an extension of the Land Improvements Act.

17815. *The Chairman :* Is that in operation ?—The Agricultural and Sanitary Improvements Act ?

I see that is your Act here, it is just a question of the title.

17816. *Mr. Gupta :* You were not suggesting that Act VI of 1920, the Agricultural Drainage Act, has anything to do with advancing money to ryots ?—Not to individual ryots.

17817. It is only *taccavi* under the Land Improvements Act ?—Yes.

17818. *The Chairman :* On page 5, under the heading "Agricultural Indebtedness," in answer to our Question 6, you say that amongst the causes which force cultivators to borrow, comparative incompetence takes the leading part. What is comparative incompetence ?—One cultivator is probably a better cultivator than another, and if that is the case he will systematically make more out of his land.

17819. One man may be a better spender than another ?—Yes, quite so.

17820. In the next paragraph you quote the work of Mr. Jack on the Economics of a Bengal Village ?—Yes.

17821. What was the date of that survey ?—1912.

17822. *Mr. Calvert :* Bengal district ?—Yes.

17823. *The Chairman :* Are you familiar with the working of the Acts dealing with debt, whether all-India or provincial statutes ?—No.

17824. So that, you do not want to answer any questions on it ?—No.

17825. And you, Mr. McLean ?—No.

17826. On page 6, you say that if the cultivator forms a habit of borrowing to finance improvement, his attitude towards credit in general will change, and that he will be less inclined to borrow for purchases which are not wholly justifiable. What do you mean by that ?—I think it is bound to happen, if he is going to improve his condition ; that is why it is put down.

17827. I wanted to know whether you had anything else in mind ?—Nothing.

17828. On the same point, Fragmentation of Holdings, have you at your disposal statistics showing the number of holdings below 5 acres and the number between say 5 and 10 acres and so on ; have you any exact idea of the size of the holdings ?—It is given in the Settlement Reports ; they vary a good deal; in the case of Eastern Bengal, from 2 to 3 acres would be a reasonable figure.

17829. So far as you know, do the Settlement Reports give the figures to show the number of holdings of a given size ?—I do not think so.

17830. Would you attach any importance to a survey of that sort ?—I do not think I can express an opinion on it ; I do not know what the procedure would be, if you were investigating fragmentation.

17831. *Mr. Gupta :* The Census Report gives the figure of the size of the holding as 1·3 acres ?—Yes.

17832. *The Chairman :* Is it within your knowledge whether the figures shown in the Census give the number of holdings below 5 acres and between 5 and 10 acres and 10 and 15 acres and so on ?—I cannot say.

17833. Do you think that legislation is necessary to deal with minors, widows with life interest, persons legally incapable, alienation and dissentients, and to keep disputes out of the Courts ? Is there anything which either of you wish to say in amplification of that answer ?—I studied the consolidation of holdings in the Punjab, and that is my view of what I saw in the Punjab, and not as regards Bengal.

17834. On the question of irrigation, page 6 of your note, I should like to ask you first whether you think there is sufficient touch and sufficient sympathetic touch between your department and the Irrigation Department ?—Yes.

17835. Would you agree with me that every irrigation problem has its agricultural problem ?—I think so.

17836. On what occasions do you meet the heads of the Irrigation Department ?—It is only in connection with particular schemes that arise.

17837. You do get round the table and talk things over ?—Yes.

17838. *Rai Bahadur Bannerji :* But beyond the question of deciding as to the merits or demerits of any particular irrigation scheme, have you any other chances of meeting with irrigation officers and discussing with them the necessities of the Province ?—There is no formal arrangement for such a meeting, it would be very advisable to have it.

17839. *The Chairman :* How about the Board of Agriculture in this Presidency ; is that in existence ?—Yes.

17840. Is it an active body ?—It does not meet very frequently ; it meets about once a year, but from next year we shall have meetings every quarter.

17841. Might that not be strengthened and developed into a very useful body ?—Yes.

17842. *Rai Bahadur Bannerji :* As matters stand now, do the recommendations made by the Board of Agriculture receive the attention of Government ?—They always receive attention from Government : it is impossible to put everything into operation, but all the recommendations which the Board of Agriculture makes, go before Government and are discussed.

17843. *The Chairman :* Are your irrigation schemes in this Presidency divided under the headings productive and unproductive ?—As far as I know there are no productive irrigation schemes in Bengal.

17844. That distinction does not exist here ?—No.

17845. Minor works, small tanks, small *bunds* and things of that sort are in the hands of the cultivators themselves ?—They are done through co-operative agencies.

17846. I want to know from you whether there is any officer in the Presidency whose business it is to give technical advice on these minor and even petty schemes ?—There is an irrigation officer attached to the districts in which these schemes are being proceeded with.

17847. Are his services appreciated by the cultivators and made use of by them ?—When an irrigation officer was appointed for Bankura district, Birbhum showed considerable anxiety to follow the example of Bankura.

17848. Do you think there is a good deal still to be done in the way of developing minor irrigation schemes ?—In Western Bengal there is certainly a very considerable scope for rejuvenating old tanks and harnessing small streams for the cultivation of paddy.

17849. What about well irrigation ?—Except in particular tracts, it is not done on a large scale in Bengal.

17850. Do you think it is capable of development ?—Yes, it is capable of improvement.

17851. Now, in the first place, how about the provision of funds for digging up these wells ?—They would have to come up for funds either through the co-operative society or the Collector.

17852. In the shape of *taccavi* ?—Yes.

17853. Do you suggest that Government should do more than they are doing at the moment to provide the technical advice and skill required for digging wells ?—As far as the actual digging of wells is concerned there is a good deal of local talent. It would not be necessary to bring special men for that work.

17854. Local talent cannot deal with the tube well ?—No, but I am speaking of the ordinary well.

17855. The well out of which water is raised by means of bullock lifts ?—Yes, either bullock lift or bamboo lift. A tube well, of course, is a much more complicated business.

17856. We shall have to ask the Irrigation Department more about it, but can you tell the Commission whether there are any peripatetic boring parties available ?—The Public Health Department has a party which go about to sink wells but they are not for irrigation purposes but for drinking purposes. There are no tube wells for irrigation in this Presidency at all. Government have just sanctioned funds for one tube well to be sunk on the Dacca farm as an experiment.

17857. Do any problems in connection with water-logging arise in Western Bengal or elsewhere ?—In Eastern Bengal water-logging generally happens. There are also portions of the Howrah district as well as in Midnapore where it is a serious problem.

17858. Who is dealing with that ?—It is not being dealt with. To a large extent there are periodic floods in Midnapore district which do a great deal of damage.

17859. Then it is a drainage problem ?—I think it is due to the too rapid flow of water from the high lands in all the districts.

17860. Have you any saline land ?—No, except in the tracts near the sea coast.

17861. Nothing to worry about ?—No.

17862. Have you anything to say as to the principle according to which water is charged for, *i.e.*, whether it is charged on volumetric basis or acreage basis ?—We have not sufficient experience of irrigation.

17863. On page 7, you suggest that an Agricultural Engineer is about to be appointed in the Province. Is he to be appointed to deal with well irrigation and other irrigation problems ?—He will deal with irrigation from wells and tube wells but larger schemes deriving their water from rivers will remain in the hands of the Irrigation Department.

17864. You say that a small Commission might be of help. Would you suggest a standing Commission ?—I think that would be a sound thing.

17865. So far as I understand, these irrigation problems in this Presidency are not problems which can be settled once for all because these deltaic rivers change their course and it seems to me as an outsider that standing committees or commissions to deal with the changing problems in any particular area are really what is required ?—I agree with you there. I think it is of great value to accumulate evidence.

17866. By that means you get a continuity of information which helps you in framing your policy ?—Quite so.

17867. I understand that you do think that a soil survey throughout the Presidency would be a good investment ?—Yes.

17868. Have you any sort of survey at all ?—We have done a rough survey but not a detailed one. We have analyses of all the typical soils of the Presidency.

17869. Is that for depth only ?—It is up to 15 inches.

17870. *Professor Gangulee :* Both mechanical and chemical ?—Chemical analyses of all soils have been made but a number of mechanical analyses have been made too. But what we want to do is to get right down to the villages, so that if we receive a request for advice from any particular place, we have only got to put our finger on the map and find out the nature of the soil.

17871. So far, nothing systematic has been done ?—It is not sufficiently detailed yet.

17872. *The Chairman :* Have you worked out the cost ?—It would be a very big item.

17873. I do not quite understand the statement on page 7, where you say, "Much land is difficult to cultivate because it is too high for late transplanted paddy and yet there is so little really high land that tanks have to be dug to make house sites"?—In order to make a site for a house you have to dig a tank. That is a common practice in this Presidency. In some places in monsoon the land is water-logged, *i.e.*, it is not true high land ; yet it is not low enough to grow transplantation paddy. In more low-lying tracts also excavation of one site is the only way of making another site high enough to build a house. In considerable tracts in Eastern Bengal, the house sites are the only dry land in the monsoon.

17874. On the same page, you give your views about the way in which these problems of the soil may be dealt with, but you do not say very much about reclaiming by means of controlling silt-bearing water. Has that been developed in this Presidency at all ?—You mean on the Italian system. That goes on naturally over a very large area in Bengal. It is the ordinary process of the raising of a delta. No deliberate attempts have been made towards that end.

17875. You do not think there is an opening for it ?—I do, but I think the work has been done in the opposite direction in parts of the Presidency and Burdwan Division. The rivers have been embanked and the silt has been prevented from spreading over the surrounding country.

17876. And the natural drainage has been interfered with ?—Yes.

17877. Whereby the fertility, on the one hand, is lowered and the incidence of disease raised to a serious extent. My suggestion to you is that if this work has been perfected in Italy, is it not time that someone attempted to apply it here also ?—It might be a very difficult thing to do it now ; but I think an attempt should be made.

17878. Referring to your answer to our Question 10 on Fertilisers, what is the limiting factor in this Presidency ?—I think the money.

17879. That is a very potent one. But leaving out money and coming to the fertilisers, what is the limiting factor ? Is it nitrogen ?—On the silt soil it is nitrogen. On the red soils there are three limiting factors ; potash and lime for jute and phosphate and lime for mustard and cereals, of course nitrogen is necessary in all cases.

17880. *Professor Gangulee :* Do you find a great deal of potash deficiency in soils here ?—Some of the silt soils are almost potash minerals.

17881. Is there a deficiency of phosphate in red soils ?—There is a great deficiency of phosphate.

17882. *Rai Bahadur Bannerji :* Is not bonemeal getting dearer every year ?—It is tending to fall a little now. Just after the War it went up to a very high price ; it was 70 per cent. higher than it was before the War.

17883. *The Chairman :* Have you anything to say upon the wisdom or otherwise of putting an export tax upon bones ?—It is certainly necessary to do so in order to conserve the supply in the country.

17884. Are bones very largely exported from this country ?—There is a considerable export of them.

17885. Where are the bones processed for export ? Is it in Calcutta ?—Yes, in Calcutta.

17886. And do the firms who are carrying out this process sell bone manure to cultivators in Bengal ?—They do sell, but they do not do any propaganda work.

17887. *Dr. Hyder :* There is no prejudice against the use of bone ?—There is in some districts. For instance, in Malda there is considerable difficulty in getting even coolies to handle the bags containing bones.

17888. *The Chairman :* Has it occurred to you that one effect of prohibiting the export of bones or of imposing such a stiff export tax as to make export not a paying proposition might be to limit the output of bones processed by these manufacturers and by raising their overhead charges to make it impossible for them to sell bones at a reasonable price to cultivators in Bengal ?—I know it is a very complex question.

17889. *Professor Gangulee :* If the export of the bonemeal be prohibited or reduced, will not that be to the advantage of the cultivator who will then be in a position to purchase it ?—You would have to be very careful. You must so adjust your duty that the fall in price may not ruin the bone manufacturer. That is the point, I take it.

17890. Is it not possible to start small bonemeal factories with the help of the co-operative societies ?—We are investigating that point now.

17891. *The Chairman :* Have you any co-operative organisations at present which are processing bones ?—No.

17892. So that the economics of the question has not yet been dealt with ?—We have only got the estimates.

17893. Is it necessary in this Presidency to take the grease out of the bones ?—It is done, as a rule, by solvents.

17894. And also by steaming ?—Yes.

17895. Is there any use in putting bones on the land in their raw state ?—We have done it in the case of raw bones.

17896. Did they break up ?—They did.

17897. Is the effect very quick ?—The effect is quite quick on acid soils.

17898. Of course, it is different in different countries ?—Yes.

17899. *Professor Ganguleé :* Have you compared that effect with that of steamed bones ?—Yes.

17900. *The Chairman :* In answer to Question 11 on page 9 under the heading " Crops, " you describe the process by which money crops are taking the place of food crops to some extent. You say, for instance, that the cultivation of ground-nuts is extending ?—Yes.

17901. That means that the money crop is taking the place of food crop ?—The ground-nut is grown largely on land which would otherwise not be cultivated.

17902. Have you areas in this Presidency where money crops tend to take the place of food crops ?—The only such crop is jute, I think, and that is a fluctuating amount. It depends on the price of jute and on the price of rice.

17903. But in the main the land is under food crops ?—Yes, almost 84 per cent.

17904. You do not think that the money crop is extending at the expense of the food crop areas ?—No, I do not think so.

17905. Is the cultivation of potatoes increasing ?—It is increasing considerably in Eastern Bengal and also in the tracts round Calcutta.

17906. As regards cultivation, in areas where you transplant paddy in this Presidency, have you introduced the single seedling method ?—Yes.

17907. Has it not been a success ?—It is not yet done very widely. We do it in our farms and recommend it to the cultivators.

17908. Is it spreading ?—Not very rapidly.

17909. *Rai Bahadur Bannerji :* In Western Bengal, when the monsoon arrives very late, the single seedling method will be a failure ?—That is a reason why it should not be introduced in those tracts.

17910. Are there important tracts where the practice is more familiar and where it will not present any real difficulty ?—Certainly, in Northern Bengal.

17911. What method do you adopt to familiarise them ?—It is a matter of using the method in our farms and advocating it through our demonstrators.

17912. *The Chairman :* I gather from your remarks on page 11 of your note that there is not great scope for improved implements in this Presidency ?—Not up to the present.

17913. Has there been any noticeable case of a general adoption of any improved implements ?—No, beyond the sugarcane mills produced by Messrs. Renwick and Co.

17914. And you are definitely of opinion that there is no field ?—There is a field.

17915. In what direction ; ploughs ?—Ploughs and harrows.

17916. Is there any sign that Indian firms are coming forward ?—We have got one or two in Calcutta.

17917. Are they active ?—They are doing very little at present.

17918. How do you account for that ?—The customers are few. The question of finance affects the sale of implements just as it does that of manures.

17919. Can they not work up a business ?—They have just started ; it is too early to say anything about them.

17920. What methods of sale are they attempting, instalments ?—Direct sales.

17921. Is that the best way ? Is that how the sugarcane mills were placed ?—They are not sales ; they hire out, but it is cash payment of the hire fee.

17922. What I am trying to get from you is whether you think the manufacturers of agricultural implements are taking advantage of the lesson learnt by the manufacturers of sugarcane mills ?—They are not, but I think the problem may be rather different.

17923. Do you think they might well do so ?—Yes.

17924. *Professor Gangulee :* Have you any Agricultural Engineer in your Department ? —No, but we hope provision for an Agricultural Engineer will be made in the coming budget.

17925. *The Chairman :* Do you know whether the manufacturers of agricultural implements in India have any difficulty in distributing their wares ? I do not mean difficulty in financing. I mean any particular difficulty in distribution connected with either the railways or other forms of transport. Have you anything to say on that question ?—No.

17926. In answer to our Question 15, on veterinary matters, you say quite definitely that the Veterinary Department should be independent of the Department of Agriculture. What is the position in this Presidency at this moment ?—It is independent.

17927. And you think it is working well ?—Yes.

17928. You think there is sufficiently close touch between the two departments ?—Yes.

17929. What do you say about the Government of India's veterinary organisation ? Have you any views about that ?—No.

17930. In answer to our Question 16 on Animal Husbandry, you point out that there is very little breeding of working bullocks going on in the Presidency ; is that the position ?—Yes.

17931. Are they mainly imported from outside ?—They are imported from places outside Bengal.

17932. Would it be possible to develop the breed of working bullocks ?—It will be possible when we fix the breed.

17933. You are aiming at the dual purpose animal, work and milk ?—Yes.

17934. When you come to urban milk-supply, you have the first cross with European breeds ?—That seems to be a promising line.

17935. In your experience does that particular cross make any contribution to the improvement in working cattle and the improvement in the indigenous breeds ?—It is not intended to do that ; the scheme is not developed.

17936. It is an entirely different problem altogether ?—Yes. On the other hand, I have come across, in different parts of the country, the progeny of European cattle which do retain stamina and vitality.

17937. Is there a demand for milk of good quality in large towns in this Presidency ?—Yes.

17938. *Professor Gangulee :* You say in the note that the demand for bulls is increasing. What arrangements are you making to supply the demand ?—We have a herd at Rangpur and another herd at Dacca.

17939. To supply the cultivator ?—Yes. Of course these two farms cannot possibly supply the whole of the cultivators in Bengal. What we will have to do eventually is to establish subsidiary farms.

17940. *The Chairman :* Are public health regulations in existence as regards purity of milk-supply in large towns in this Presidency ?—Not outside Calcutta.

17941. Do you think that the enforcement of reasonable regulations as to purity makes a very considerable contribution towards the problem of extending dairying, in that it gives to the dairyman who provides a good article a reasonable security as to markets, whereas the absence of such enforcement means that those who are not ashamed of adulterating milk, cheese, *ghi* and butter, are able to sell at so low a price as to make dairying according to modern ideas unprofitable ? Have you considered that problem at all ?—It is very necessary to have legislation to stop adulteration. We have to apply it to everybody. The difficulty would be the administration of it.

17942. You have just told us in evidence that these regulations do exist as regard. Calcutta. Is it within your knowledge that they are enforced ?—Yes ; they are enforced.

17943. Do you know whether milk for sale in bazars is liable to inspection ?—Yes.

17944. Is it inspected ?—Yes.

17945. Do you know whether the practice of adulteration, not necessarily fraudulent, is general in this city ? Do you know whether the working classes in this city deliberately buy watered milk ?—Yes ; they do.

17946. Is the milk for the city supply derived mainly from cows or from buffaloes ?—I should think half and half.

17947. Are these cows stall-fed ?—Yes. The Calcutta supply is mainly from stall-fed animals.

17948. Are the buffaloes stall-fed ?—Yes.

17949. Are they within the city boundary ?—Both in and out.

17950. Where is the outside area ?—All round Calcutta.

17951. There is no distant dairying area ?—No.

17952. Is there any opening for the development of the dairying industry in your hill tracts ?—The hill tracts are very far from Calcutta.

17953. Too far ?—Yes.

17954. On the question of provision of good bulls, is there any demand for bulls ?—It is very small at present, but there is an increasing demand from co-operative societies, agricultural societies and so on.

17955. If the breeding of good bulls is going to have an appreciable effect in improving the race of cattle, is it also necessary to have good cows well nourished ?—Yes.

17956. Do the cows get a full share of the fodder ?—Most of them are underfed.

17957. And the bullocks ?—The same.

17958. So that the position of cattle in this Presidency is thoroughly unsatisfactory ?—Yes ; I think that is true.

17959. Then you say, and it appears to me rightly, that the provision of further food supplies for the cattle, supplies which are necessary to improve the working power of the cattle, and so make better cultivation possible, must be derived from fodder crops, and you point out the openings in various districts where fodder crops could be introduced between two existing crops ?—Yes, with irrigation.

17960. Does irrigation exist in the areas you are thinking of, or has it yet to come ?—It has yet to come.

17961. Do you think further irrigation in those areas would make a real contribution towards the improvement of cattle ?—It has still to be absolutely proved by demonstration. But all the results that we have so far got tend to show that it is a feasible proposition.

17962. Would you agree that the improvement of cattle in this Presidency is one of the major, if not the most important of agricultural problems ?—Yes.

17963. What special officer have you whose time is devoted to the work of cattle improvement ?—We have not got a special officer at the present moment. His appointment is now being decided ; he is about to be appointed.

17964. Do you agree that until some such officer is appointed there is very little hope that sufficient attention will be given to the cattle. Bengal's major agricultural problem is only now receiving attention ?—Yes. A proposal to employ a cattle expert in 1922 was negatived by the Legislative Council.

17965. Have you anything to say on the question of silage ? I observe from a note that in water-logged areas you find it necessary to line the pit ?—Every pit will have to be lined.

17966. Is it cheaper to line the pit than it is to build a tower silo ?—We have gone into the figures. I cannot give the exact figures now, but as far as my memory goes, the cost is very much the same.*

17967. Have you considered the possibility of making a pit by first making a mound ? Does that work ?—We have used pit silos on the banks of tanks.

17968. How do they work ?—They are not very bad because they are above the water level. There is no doubt that if the water is kept out at the time when the silage is in the pit, you can make good silage.

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* The Superintending Engineer, Dacca, considers that a pit silo carefully lined to keep out subsoil water would be as expensive as a tower silo of similar capacity.

17969. Provided you once achieve the essential process of fermentation, silage has very considerable resistance against occasional water-logging ?—Yes.

17970. *Professor Gangulee :* What crops do you use for silage ?—Maize, millets, cowpea. peas, any bulky growing crop. We are experimenting even with water-hyacinth.

17971. *The Chairman :* I rather gather that in your view a good deal more experimental research is required into this question of preserving fodder ?—I think so.

17972. Would you agree that is a very important problem in this Presidency ?—I think it is vital.

17973. Now, what about sheep and goats ; is there any opening for sheep at all ?—We keep a small flock of sheep on the Dacca farm ; they multiply very rapidly. There are possibilities, but we have not sufficient experience. We want to go into that problem.

17974. And the breeding of goats ?—And that too.

17975. Has it ever been suggested to you that there might be a remission in part or whole of the land revenue on the land used for the growth of fodder crops ; in other words, the State might subsidise the growth of fodder crops ?—That has not occurred to me, but it would hold out a very great inducement to the cultivator.

17976. It is more attractive to your department than to the Revenue Department ?—Yes. In this country it is in *khas mahals* that it could be done.

17977. But if some encouragement could be given it would probably give it a start ?—Yes.

17978. Even if it were to be a temporary assistance ?—Yes.

17979. *Rai Bahadur Bannerji :* When you say ' The landowner in Bengal is generally apathetic regarding agriculture, ' what have you in mind ?—I wish to say that there are exceptions and that there are indications that some landowners are beginning to appreciate the importance of agricultural improvement.

17980. *The Chairman :* You think there is an improvement in that direction ?—I think so.

17981. On page 12, in answer to our Question 17, I should like to divide up this question under the two heads of part-time occupations on the one hand and on the other, subsidiary industries. Do you approve of the classification ?—Yes.

17982. Now as regards part-time occupations, taking first your irrigated areas, have the villagers any important season in which their whole labour and time are not required on their holdings ?—About the irrigated areas, I think, it would be better if we classify them according to the land which has one crop a year and land which has two crops a year.

17983. Taking your own classification, what cultivators in this Presidency have part-time occupations ?—There are areas where there is only one paddy crop during the year. On those areas the cultivator sows the seed in June, transplants in July and reaps in November and December. It is a six months' crop. Then apart from small garden cultivation on a little piece of land round his house and that sort of thing, he probably has several months when he has nothing to do.

17984. They do not migrate in those seasons and do work elsewhere ?—In some cases they do.

17985. Where do they go ?—There is migration from Chittagong to Burma and from Nadia to Barisal.

17986. *Rai Bahadur Bannerji :* And has he not malarial fever for about two months in the year ?—Yes, probably for sometime.

17987. He cannot be expected to do any hard work during that time ?—No.

17988. *The Chairman :* A little mild exercise in the way of spare-time occupations might be a good thing, might it not ?—I think it will help him a good deal.

17989. Have you anything which you wish to tell the Commission about these spare-time occupations ? Do you think there is a large field for developing them ?—There is certainly, particularly in the tracts I have mentioned.

17990. Who is responsible for that development ?—That would be the Industries Department. I think that every cultivator could grow garden crops ; also a little cotton and work up the lint in the house. I think that would certainly be a sound principle.

17991. Is silk-rearing and weaving a part-time occupation in any district of this Presidency ?—Yes. In Malda there are a number of rearers who generally take up silk-rearing.

as a part-time occupation. It is an important part-time occupation in conjunction with mango cultivation and agriculture.

17992. Is lac cultivation a part-time occupation ?—I would say so.

17993. Is that under you or under the Forest Department or the Industries Department ?—We have been asked for advice on a number of occasions and we have given help through our Entomologist whenever it has been possible; but we have no special department for dealing with lac cultivation.

17994. Which department in Government is responsible, the Industries or the Forest ? —It would be Industries. There is a lac institute now near Ranchi in Bihar.

17995. Is lac an important industry in this Presidency ?—It is of considerable importance.

17996. There is no department responsible for it with its own technical officer ?—As far as I know, no work is being done at present on that, no systematic work.

17997. Do you do anything in the way of popularising poultry ?—No; we can hardly say we have got far enough to do very much but we have just appointed a special officer, and work has begun.

17998. *Dr. Hyder:* Is there any method of protecting chickens against kites ? The gentleman whose report I have in my hand says that chickens are taken away by the kites.—Wire netting on the top.

17999. *The Chairman:* Is there caste prejudice against keeping up poultry in any of the districts ?—Not very strong.

18000. You do not think that would stop you ?—No.

18001. *Rai Bahadur Bannerji:* Will a Hindu ever take up the poultry business ?—I do not think the prejudice is so strong in Bengal. It is probably stronger in Western Bengal than in Eastern Bengal.

18002. *The Chairman:* As a spare-time occupation, is fruit-growing being developed at all ?—We have done very little, practically, in fruit-growing.

18003. Have you got a horticultural officer ?—There is a scheme for a horticulturist but we have not appointed one yet; it is a question of funds.

18004. So much for spare-time occupations. Now before I return to subsidiary industries I want to know whether you have ever asked yourself if there is room anywhere in the Presidency or in areas sufficiently near the Presidency for the development of hydro-electric power ? Do you know anything about that at all ?—A committee did investigate the subject some years ago and I believe, reported favourably.

18005. That is another scheme ?—Yes.

18006. But there is no electricity yet ?—No.

18007. Now in connection with the development of subsidiary industries designed for working up the raw material produced on the cultivators' holding, do you think there is any opening for investigation in that direction in the Presidency ?—I think it is a very difficult question to answer. I know a certain amount about it, but I do not think my views will be of very much value to the Commission.

18008. This is a question on which I am sure you will have a view. Do you think that if the development of hydro-electric power had the effect of persuading those who are thinking of starting factories to choose sites in rural areas rather than to congregate at the port towns, that would be an advantage to the country side ?—I think it is a question of local labour supply and facilities.

18009. You do not think the presence of a few factories dotted about the country side might serve to raise, at any rate, the ambition for a better standard of life ?—I suppose it would.

18010. *Professor Gangulee:* It might relieve the pressure on the land a little bit ?—It might to a certain extent, but it is a question of labour.

18011. *Rai Bahadur Bannerji:* You know the establishment of these numerous rice mills in the country districts affected labour ?—I do not think that has affected the problem very much.

18012. *The Chairman:* Certainly in my own country our experience is that the presence of an industrial population in the midst of an agricultural population tends obviously and very definitely to raise the rate of wages and, I think, the standard of living, certainly the ambition.

Rai Bahadur Bannerji: It is the same in this country also in those tracts in which rice mills have been established.

18013. *The Chairman:* Of course, the establishment of manufacture in the port towns has very little affected the standard of living or outlook in rural areas; so that you do feel that from the agricultural point of view it might be well worth seeing whether some development of the hydro-electric potentialities of the Presidency cannot be pushed?—I think it should certainly be investigated.

18014. With regard to agricultural labour, you describe one stream of labour movement as emigration to Assam. Have you any other important movements of the population to other parts of India or to foreign countries?—There is an import of labour from Bihar to Bengal.

18015. That is an import?—Yes; there is no export so far as I know.

18016. There is no movement of agricultural labour to the Malay States or to any country of that sort?—I am not aware of it.

18017. Is there any movement to Assam?—That would be colonisation more than labour.

18018. *Rai Bahadur Bannerji:* Are you aware of the fact that some labour of West Bengal is being taken to the coal fields of Bihar and Asansol?—Yes.

18019. *Professor Gangulee:* Is any labour going in considerable quantity to the tea gardens?—Not Bengal labour, except perhaps a small proportion from Birbhum.

18020. *The Chairman:* On your answer to our Question 19, Forests, I want to ask you whether you think that there is sufficient touch between your department and the Forest Department in the Presidency?—I think there is. We cannot meet very frequently, because their work is chiefly concerned with the boundary districts.

18021. Most distant from your own headquarters?—There are very few Government forests in the actual plains, they are either in the north, in the Terai and Darjeeling hills, or in the Chittagong Hill tracts, or in the Sunderbans.

18022. *Rai Bahadur Bannerji:* Nearly all the forest in Western Bengal is zamindari?—Yes.

18023. *The Chairman:* The forests there are owned by, and the timber is the property of, zamindars?—Yes.

18024. Have you important forest areas where cultivators have grazing rights?—No.

18025. So that that problem does not apply?—I do not think it applies in Bengal.

18026. Have you ever considered the possibility of forming a fodder reserve against fodder famine?—No, we have not. We do not get fodder famines in the same sense as in the Punjab or other Provinces.

18027. I wanted to be certain that you had not that problem in certain districts. So that you are mainly interested in forests because of the denudation as a result of over-cutting in the hills?—Yes.

18028. Do you know whether any attempt is being made to control what you call *jhuming*, that is shifting cultivation?—It is causing a good deal of anxiety; I have had considerable correspondence recently with the Deputy Commissioner of the Chittagong Hill tracts.

18029. Is it an agency tract?—Yes.

18030. There of course Government can control?—Yes; it is a very difficult problem to tackle.

18031. It is a very serious thing for the cultivators in the plains if they are going to be deluged with silt while at the same time valuable land is being washed away?—That does not happen in the Chittagong Hill tracts; it has a heavy rainfall, but it certainly has not proceeded so far as that. The erosion to which I have referred takes place almost entirely in Western Bengal.

18032. Silt is a blessing in the right place in limited quantities, but occasionally it may come in such large amounts as to cause the general ruin of important tracts?—Yes; I think I have already said that occasionally floods come down; there are frequent floods coming down in Western Bengal.

18033. Have you any instances of Government control of markets in this Presidency?—No.

18034. Do you know anything about the Government control of markets in Berar?—No.

18035. Have you any views as to the possibility of developing that ?—No.

18036. You have described the method and the channels of the marketing of jute. Would you agree that, to some extent, in the case of an export crop, the cultivator is protected against the more extravagant exactions of the middlemen by the fact that the buyers representing large concerns move about the country side and more or less rule the market ?—That is true.

18037. Of course, where the cultivator is tied hand and foot to a moneylender, he has to take what the moneylender chooses to give him ?—Yes ; there is great scope for the co-operative movement here.

18038. *Professor Gangulee :* For carrying on marketing ?—Yes.

18039. Is anything being done in that direction ?—Yes.

18040. *The Chairman :* What about the registration of commission agents ; has that occurred to you ? Would that be a feasible proposal ?—If it is registration of the people going round in the districts, it is very difficult.

18041. Do you know anything about buying and selling on commission by middlemen ?—In the jute trade, certainly, but I think it would be very difficult to control it, because the cultivator himself is often a small dealer.

18042. Is there much dealing between the cultivator and the *faria* ?—No ; the *faria* buys small quantities direct.

18043. And the *bepari* ?—He is either a dealer or a commission agent.

18044. What I want to know from you is whether, when the man is ostensibly acting as a commission agent, he is very often in fact acting as a merchant ?—I dare say he does.

18045. That would not happen if registration of commission agents were to been forced ? —It might be easier in the case of the *bepari*, but not in the case of the *faria*, because the *bepari* would be a bigger man, and they are not quite so numerous.

18046. *The Raja of Parlakimedi :* The *bepari* is always a merchant ?—He is a changing sort of person ; he is at times a commission agent, and at other times he is a dealer, just as it suits him.

18047. *The Chairman :* If you are selling my goods on commission, I know you will get the best possible price in order to earn the higher commission ?—Yes.

18048. But if you represent yourself to be a commission agent, but are in fact buying for yourself, it gives you an opportunity, of which you may or may not choose to avail yourself, to do me down ?—Yes.

18049. To give me about half the value of the produce, take a very small commission and make up the whole of the difference by selling yourself ?—Yes, quite.

18050. On this question of marketing, do you feel that sufficient is known about the channels of marketing and the methods by which intermediaries operate in this Presidency ?—I do not think so.

18051. Do you think that a further survey might be useful ?—I think so.

18052. Would you agree that one of the most important lines of advance which is possible is to see that the cultivator gets a fair share of the real value of the things he grows ?—Absolutely so.

18053. It is no use showing the cultivator how to increase his crop, if he has not got the means of getting a fair share of its value ?—Exactly.

18054. On the question of weights and measures, is the practice very uneven throughout the Presidency ?—I think it is very uneven.

18055. Have you considered the possibility of standardising weights and measures ?—I cannot say I have.

18056. Would either of you like to say anything about it ?—I think it would help a good deal, if it could be standardised, but there would be a good deal of local prejudice.

18057. On the part of the dealers in the main ?—Yes, the dealers chiefly.

18058. Would you agree that the more complicated the method of measurement and exchange, the greater the advantage which the middleman would have, because he is doing it every day of his life, whereas the cultivator does it only when he has produce to sell ?—Yes.

18059. There is something in human nature which persuades most cultivators in all countries that they know as much about marketing as any middleman in the market ? Yes.

18060. You do not express any view as to whether the time has come when an attempt should be made to standardise the weights and measures in this Presidency ?—I would certainly say that it is feasible, and it should be done as soon as possible.

18061. On page 14, is your answer to Question 20 (*c*) printed as you wish it to be ? You say "The co-operative jute buying organisation now being established in Bengal." Is it jute buying or jute selling ?—The Registrar of Co-operative Societies is here, and I would ask him if he considers that is correct.

18062. Who put this in ?—It is mine.

18063. Is it a jute buying organisation ?—It is a buying and selling organisation.

18064. Its main purpose is to sell the cultivators' jute ?—They take the cultivators' jute and sell it at the best possible price ; it is probably a misnomer.

18065. *Rai Bahadur Bannerji :* Do you not mean there that this co-operative society which will be formed and of which the cultivators themselves will be members will purchase all the jute crop available in the village and will stock it and sell it at the best rate ?—That is the idea.

18066. And the profits will go to the cultivators ?—Yes.

18067. *The Chairman :* I do not know whether it is realised, but of course when you are starting a selling organisation, one of the most difficult things you have to decide is whether the cultivator or the organisation as a whole is to take the trading risk, that is to say whether you are going to give the cultivator the market price on the day on which he brings his produce to the market, or whether he is to be given an advance and subsequently the balance of whatever price may be obtained ?—Yes.

18068. You do not know which practice obtains in this particular case ?—No.

18069. Does it occur to you that there is a big field for an Agricultural Economist in connection with these problems touching marketing ?—If they are to be investigated, there will have to be a man on special duty to do it.

18070. It is very difficult really to get down to the business of improving the cultivator's position in this respect unless you know what is happening ; the hearsay reports of the enormous margins that the middleman is enjoying are not very helpful, are they ? —I do not think so ; you want exact information.

18071. Do you think that sufficient is being done now in this matter of information as to the reputation of Indian produce which is exported and the placing of that information at the disposal of the grower and the trade ?—I think that more effective steps should be taken to let the cultivator have information about crops and prices and statistics of general marketing.

18072. *Professor Gangulee :* At the present moment, he does not get any information ? —There is no official means of giving him any information.

18073. *The Chairman :* Would you agree that, in some directions in which India appears at this moment to have a monopoly, her position is in fact being threatened ? —In the matter of jute ?

18074. Take the question of hemp ?—No, I do not think so ; I do not think it is in the case of jute either.

18075. You think that her position is secure ? How about the question of oil-seeds ? —I want to say that it is secure in regard to jute and hemp, for the present.

18076. Would you agree that the best way of securing these advantageous positions and retaining them is by looking about the world, watching most closely the trend of world demand and world market, and making that information available for the distributors, merchants, and particularly the growers of this country ?—Yes.

18077. On the question of Indian hemps, I am going to read to you a letter as it is not marked private. It is written to the Indian Trade Commissioner in London by Messrs. Wigglesworth. It runs as follows : " In connection with Indian hemps, the following remark in a letter from our representative in Paris, has a bearing on the necessity of improving the quality if consumption is not to be diminished seriously. 'The French buyers inform me that the time may come, perhaps soon, when they will have to give up Indian hemps altogether, even dressed, on account of the large quantity of dust. Workers everywhere object to the dust ; in fact, it is not human to expect workers to stay for hours in clouds of dust. Ventilators and respirators do not improve matters much.' There is no doubt that India will have to look to its laurels with regard to hemp if it is to secure trade in competition with Russian hemp, which has now fallen considerably in price, the quality of which is much more suitable for the manufacture of twines and cordage." Is that not a direction in which India's present position is tending to

deteriorate to a serious extent? That looks serious, does it not? It looks to me uncommonly serious?—There have been complaints about the dust in Indian hemp for years.

18078. What steps have been taken to attempt, at any rate, to inform the cultivators as to this position and to make suggestions for the remedying of these evils?—In Bengal there is only one tract where hemp is grown and that is in the Serajgunj sub-division. The hemp that comes from Serajgunj is the best hemp that is exported from India. It is the cleanest hemp in the market and it fetches the highest price in the market. The information that I have obtained in regard to hemp from the United Provinces and from Itarsi in the Central Provinces is that their main difficulty is the water in which the hemp is retted. Their water-supply when the hemp crop is retted is insufficient for retting and they have to ret the hemp in pools of mud, with the result that the fibre obtained is a mass of dirt. That is very largely responsible, I think, for the dirty state of this Indian hemp. Of course, in Serajgunj in Bengal, there is plenty of water for retting. That probably accounts to a large extent for its cleanness.

18079. There is another very important buyer in Europe whose name I am not entitled to mention, who tells me in his letter that Indian hemp is defective. There is too much dust in it. Another correspondent tells me that fibre suffers from the way in which it is rolled up in packing?—Yes.

18080. The defects have, I suppose, been improved in recent years?—The Bengal hemp is marketed in Calcutta and it is in quite good condition.

18081. On the question of jute. Would you agree that such information as is at the disposal of the Government of their agents overseas, while it is placed at the disposal of the trade, is never placed at the disposal of the cultivator?—I think it is true to say that no serious steps are taken to inform the cultivators of the prices in the country districts.

18082. I do not know whether the opinion of cultivators would be sensitive to information of that sort?—In the jute growing tracts cultivators take a great deal of interest in the prices. In fact, I have been told that they actually receive telegrams from local dealers in Calcutta.

18083. Are you quite satisfied that India's position in the matter of jute is as unassailable as you suggest?—I said as regards the immediate future. I think I would rather not say in public what I know about it.

18084. If you wish to tell the Commission something in private about it, we will give you an opportunity?—I am prepared to make a short statement in private.

18085. On the broad question, you will agree with me, I am sure, that it is extraordinarily important that as so much of India's prosperity depends upon export markets, every attempt should be made to convey to all concerned all the information available from importing countries on the technical and commercial problems connected with these crops?—I do agree with you.

18086. Turning to page 14 under the heading "Welfare of Rural Population." You say investigations of the kind are in progress, that is, investigations of the economic position of cultivators. Could you give us any particulars about these investigations which are in progress?—I hope to be able to do so by the time you come to Dacca.

18087. In the meantime, you have nothing to tell us?—Not very much. I hope when you come to Dacca we shall have figures from several villages to put before you. They are not the results of complete investigations but they will give you some sort of idea as to the present state of things.

18088. On this question of the welfare of the rural population, can you provide the Commission with any general statement of the powers of local authorities *vis-a-vis* agricultural problems? Are local authorities empowered to spend funds on agricultural matters of any sort?—The District Boards are allowed to allot money for agricultural improvement.

18089. *Mr. Gupta:* Under section 60, they are. That question was raised under the drainage scheme, one opinion was that they are not, but I am not agreeable to that opinion.

18090. *Rai Bahadur Bannerji:* But the general custom up to date has been not to do it?—What I said was based on my experience of Mr. Gupta's districts.

18091. *Mr. Kamat:* Will you turn to the last page of your printed memorandum* ? Is not the point clear there that the Local Self-Government Act was amended in 1920 and under that amendment District Boards can help agriculture?—I cannot express an opinion.

* Not reprinted.

The Chairman: If the witness is not in a position to give the information, we will get it elsewhere.

18092. Are you familiar with the statistics of inter-provincial rail-borne trade which was discontinued some years ago and which it is now proposed to renew ?—I hope they will be renewed soon.

18093. Do you think it is valuable ?—Yes. I could give you one instance. In the case of rice we wanted some information as to how far Bengal is self-supporting in the matter of rice. The whole essence of that inquiry depended upon the amount of rice taken away from Bengal and we could never have got that unless the report was published.

18094. So, as far as this Presidency goes, you are strongly in favour of the renewal of these figures ?—Yes.

18095. *The Raja of Parlakimedi:* Let us go back to Pusa. Are you satisfied with the situation of the farm ?—I think that Pusa estate is extraordinarily well kept.

18096. Do you approve of its being located at that place ; I mean, the selection of site?—It might have been more central, I suppose ; but you could not change it now.

18097. What is your opinion about Pusa meeting the demand of paddy growers ?—I do not think Pusa should be expected to meet the demand of paddy growers, because the amount of paddy land in Pusa is very small.

18098. But the farm is in the heart of a paddy growing country ?—Yes ; but I do not know that Pusa would be able to do that. I should have thought that would be more local problem for investigation. I say that advisedly, because although Pusa has done a good deal of work in regard to wheat, the types of rice grown in Madras and those grown in Bengal are not satisfactorily interchanged. As a rule our experience has been if we import varieties of rice into Bengal for trial they behave abnormally. So that I should rather deprecate Pusa taking up the improvement of rice in the sense that it has done with wheat or gram.

18099. Then, are you thinking of having a separate farm for paddy research ?—I think each Province ought to do a great deal of local research on rice.

18100. Is there anything being done in Bengal or Bihar ?—On rice ?

18101. Yes ?—The investigations into rice in Bengal practically occupy the whole time of the Economic Botanist, Dr. Hector.

18102. Are these methods made accessible to the cultivator ?—Yes. There is a large and increasing area under the improved varieties of rice, and we are establishing now, in order to hasten the process, in districts which are suitable for the improved varieties of rice, small seed farms in the organisation of which we hope to collaborate with the Co-operative Department at a very early date. I have already discussed it with the Registrar that he shall buy up the paddy of each farm and either distribute it or exchange it with neighbouring cultivators for their own paddy.

18103. What characteristics of the crop would these research institutions on paddy investigate ?—Largely, yield ; it might be also fineness of grain, scent, length of straw ; everything.

18104. At present what are the aims of research ?—Largely yield, that is, increasing the yield of grain.

18105. Irrespective of the quality or the fineness of grain ?—There are various varieties of paddy which are being selected. For instance, the *balam* paddy in the Barisal district, is the finest paddy, at least one of the finest paddies in India, and we are working on that and we are also working on coarse varieties which are grown in other districts.

18106. But the coarse varieties are in greater demand, being consumed by the lower classes ?—They are.

18107. Therefore, I think the department should concentrate more upon that than on the finer varieties. The department ought to pay more attention to those varieties which are more popular with the ryot population than to the finer varieties ?—Yes, you must give proportionate attention to varieties which are commonly consumed.

18108. In answer to Question 2, page 3, you say that at present the study of agriculture is not very popular ?—I think that is true.

18109. I think your reason is there are not many appointments available in the Agricultural Department. Would it improve matters if waste land free of premium was offered to agricultural graduates by the Government ?—The question is whether there are waste lands or not ? If you have got valuable waste lands, yes. But in Bengal the waste lands, where there are considerable areas of them, are in difficult situations, or are not very productive.

18110. *Professor Gangulee:* Are you referring to cultivable wastes ?—Yes. It may be malarious or it may be unfertile soil, or it may be some other condition which prevents them being taken up by the cultivator.

18111. *The Raja of Parlakimedi:* If you give cultivable wastes in the neighbouring Province of Bihar and Orissa, would that give a sort of impetus to these boys ?— I think there is scope for them in Assam. If they care to go to Assam and break up the jungle tract there, there is real scope for them.

18112. Has it been made known to the public ?—It is known. The Bengal cultivators are going up there by tens of thousands; they are colonising Assam.

18113. As regards Irrigation (page 6) you mention that there is scope for irrigation in Bengal but that it has not been taken up. May I know what is keeping it back ?— It has been a matter of funds. We have just obtained from the Government sanction for the sinking of a tube well on the Dacca farm for experimental work on the value of irrigation for crops. That tube well should be ready next hot weather, and from that we hope to get results which will enable us to make recommendations for the Province in general.

18114. Has the Legislative Council been actually approached for financing this sort of irrigational schemes ?—All the schemes have to go through the Legislative Council, of course.

18115. Proposals have gone up to them ?—Yes. It is really the Finance Department which has to say which schemes are the most urgent.

18116. Do you mention any specific methods of irrigation or do you leave it as irrigation in general ?—This is a particular proposal for the use of water from a tube well.

18117. But there are other irrigational sources ?—Yes.

18118. Is it just because it is a tube well that they did not approve of it ?—No, not at all.

18119. *Rai Bahadur Bannerji:* That does not properly fall within your province ?—No.

18120. *Professor Gangulee:* What is the point of contact between your department and the Department of Irrigation ?—This is the point of contact in these schemes. We shall show the Irrigation Department what our results are. We shall tell them, "We have done this work; we have found that these crops can be grown, so much can be obtained by irrigation; it is up to you to do the rest."

18121. *Rai Bahadur Bannerji:* Cannot your department make a request to the Department of Irrigation for any particular irrigation scheme ?—Yes; we are asking them. I can give you another instance. In Eastern Mymensingh some months ago a number of cultivators who grow *boro* paddy (that is transplanted paddy, grown in the cold weather and the hot weather) came to us and said that through lack of rain, their paddy is often adversely affected in the hot weather. They suggested that there was river water or *bhil* water near by, and it might be possible to pump water to the *boro* paddy lands to ensure them a regular full crop. We immediately wrote to the Irrigation Department about this, the local Irrigation Engineer visited the tract with one of our officers and put up an estimate which is now before Government.

18122. *The Raja of Parlakimedi:* In answer to Question 24 (*b*), you mention that there are obstacles in the way which discourage improvement of land. May I know what your suggestions are to improve the situation ?—I am afraid I must confess considerable ignorance. But it seems to me from all the information I have got that anything which would tend to bring the landlord and the tenant together to make a mutual agreement outside the court is really what is needed.

18123. To minimise as much as possible going to courts for confirmation ?—Yes, exactly.

18124. Then, as regards fodder crops in this Province, do the cultivators grow fodder crops as much ?—No; practically none.

18125. Not even Guinea grass ?—No, the only way they can be said to grow fodder is, on the low *bhil* lands, in the cold weather, when the water goes down, they often broadcast a pulse, generally *khesari*, which is grazed by the cattle. When the cattle cannot get grazing in the cold weather they get a little grain.

18126. It is entirely for the cattle ?—It is chiefly for the cattle. So far as I know that is the only deliberate cultivation of fodder crops that takes place.

18127. Mr. P. J. Kerr in his "Improvement and Care of Cattle in Bengal" refers to the giving of mustard cake as part of concentrated food. Is it given throughout the year for milch cattle ?—Yes.

18128. Does it not have a bad effect upon the milk-giving property ?—It is not a good cake, but it is the only cake that is available all through the districts. You cannot get soybean cake or cocoanut cake in Bengal.

18129. Gingelly cake ?—No. Mustard cake is the only cake that we have got on a sufficiently large scale.

18130. Is there any area under ground-nut in Bengal ?—There is a very small area in Western Bengal.

18131. Is the stuff exported as it is or after the oil is extracted ?—It is all used up locally and is not used for oil extraction. I do not think there is any export.

18132. It is only a very small area ?—Yes.

18133. As a bye-industry would you encourage fish-breeding ?—Yes.

18134. Fish is a very important factor in the diet of Bengal ?—I think it is possible that pisciculture might be an important subsidiary industry.

18135. Are you prepared to include it in your memorandum ?—Yes. Was it not mentioned in the memorandum ?

18136. *Mr. Kamat:* Is it not a fact that your Department of Fisheries has been closed ?—Yes.

18137. *Sir James MacKenna:* Mr. Finlow, the Commission, as you know, have just come up from Madras where at Coimbatore we have seen the work of the Government Sugarcane Expert. I want to know whether you have had any experience of these Coimbatore canes ?—We have tried a large number of the Coimbatore canes and some appear to be particularly suitable to Bengal conditions.

18138. Are your canes in North Bengal the thin variety or the thick ?—In parts of Rajshahi there is a fairly thick cane but in the greater portion of the Province the canes are thin.

18139. You have got about a couple of hundred thousand to a quarter of a million acres of sugarcane ?—Yes.

18140. Of that how much would be under thin ? Three-fourths ?—Yes ; I think so.

18141. You think the Coimbatore canes can be introduced into a considerable area ?—Yes, excepting in tracts when reed canes grow on lands which become submerged in the monsoon.

18142. How do they compare in the yield ?—As regards the outturn of *gur* the Coimbatore cane seems to be 20 to 25 per cent better than *tanna* (the cane hitherto advocated by the Bengal Department of Agriculture), and the juice forms a better *gur*.

18143. Have these Coimbatore canes been developed to the stage where you could judge whether they had considerable advantage over the others ?—We laid it down that five years should pass before the cane was passed on to the cultivator, because of the danger of disease. The five years have passed now and the Coimbatore canes have really begun to give good results. The cultivator has seen it on our farms and he is taking them.

18144. They are taking an interest themselves ?—Yes ; they have actually come to the farm and taken the roots of old crops which are being discarded in the course of rotation.

18145. To what extent was your department affected by the Retrenchment Committee's operations ?—It was rather badly retrenched. The District Agricultural Officers were reduced from 63 to 31 and demonstrators from 180 to 80.

18146. And the Deputy Director grade ?—In the Deputy Director grade the appointments of two extra Deputy Directors were postponed.

18147. So, on account of the retrenchment your operations were practically reduced, so far as the personnel goes, by about 50 per cent ?—They were very seriously reduced.

18148. And that was accepted by the Government ?—Yes. The Retrenchment Committee's recommendations were much more drastic.

18149. But the final decision of the Government was that the operations of the Agricultural Department should be practically reduced by 50 per cent ?—Yes, something like that.

18150. Do you approve of that policy ?—No.

18151. Do you think that generally the population of Bengal approve of that ?—I think that on the whole it was bad, because although a number of them were not sufficiently

trained, we should have been able to train them in the meantime, whereas now we have to take in raw men for work which is very urgently needed.

18152. Has this step on the Report of the Retrenchment Committee been taken as a final closing down on the part of the Government or can you still send up schemes for development ?—Yes; schemes we send up to Government are seriously considered and are approved by Government provided funds are available. That is the crucial point.

18153. But still you are encouraged to send up your schemes ?—Yes; and they are prepared to discuss them.

18154. So the retrenchment was purely temporary, I hope ?—Yes. His Excellency said, after the retrenchment had been effected, that if we could show sufficient justification for extra staff the Government would consider it.

18155. Retrenchment was largely due at that time to the financial position ?—Yes; at that time the position was acute and they really did not know where to turn for money.

18156. You can still send up schemes ?—Yes.

18157. Have you got such a scheme put up ?—Yes.

18158. What are you asking ?—We want to ask for a Deputy Director in every division and a District Agricultural Officer in every district and possibly extra men in the sub-divisions and an increased number of demonstrators. That is the original policy of the Government, to have a larger number of demonstrators.

18159. You are just providing for that in your scheme ?—Yes.

18160. Of your staff how many are Bengalis ? Have you had to indent on other Provinces for a large portion of your staff ?—No, not very much.

18161. I think you will admit that the Bengal student has very few opportunities really of proving his capacity for agricultural work ?—Yes.

18162. Owing to the absence of an Agricultural College for agricultural training ?—Yes; I think an Agricultural College or an Institute is an urgent necessity.

18163. It is rather lack of opportunity than lack of capacity ?—I do not think there is any lack of capacity in Bengal.

18164. Facilities are not available ?—It is possibly more or less a hereditary matter; agriculture has not been a popular thing with the generality of better class people in Bengal. It may take a generation to get rid of the idea.

18165. In answer to a question put by the Chairman you said you were of opinion that the Bengal Honours student from the Dacca or Calcutta University was quite promising in research work ?—Yes.

18166. So if you get adequate facilities for training, there is no reason why you should not have a thoroughly competent staff ?—I think so.

18167. If you start this Institute, are you going definitely to confine it to the training of candidates for the department ?—We would take others if they desire to come, without any promise of employment.

18168. What is your experience of Indian Agricultural Colleges ?—I cannot say very much; but I have been told that in the Punjab there is a certain amount of demand for education from the sons of cultivators; I do not know how far it is correct.

18169. Will you say that the primary object of your institute is to train officers for the Department ?—Yes; I think so; that must be the primary object.

18170. Do your Deputy Directors live on their farms ?—Yes; the Deputy Director in Eastern Bengal lives in Dacca; the Deputy Director of Northern Bengal, at Rangpur; unfortunately for Western Bengal at present the headquarters is in Calcutta; it has always been rather a disadvantage.

18171. Do these Deputy Directors do any actual research work themselves ?—At Dacca certainly; the Deputy Director of Eastern Bengal has always taken part in field research. It has been a question of collaboration between the Deputy Director and the experts.

18172. And the others ?—In the other places the Deputy Director does collaborate with the expert in the same manner in his farm headquarters, in Northern Bengal, for instance.

18173. Do you consider the method of organisation of research by crops instead of by geographical areas better, the Madras system in which special staff is dealing with a particular crop and is responsible purely for scientific work, propaganda being left to the Deputy Directors in the geographical areas which they deal with ?—My own appointment of Fibre Expert is more or less an appointment on those lines. I find it is an advantage, to allow him to do the work which seems to suit the necessities of the situation.

18174. In this Presidency jute and rice are the important crops ?—Yes.

18175. Your oil-seeds and other crops are not important compared with jute and rice ?—They are subsidiary crops ; they are not important compared with jute and rice.

18176. Now before a piece of research work is undertaken, how do you proceed ? What is the method of attacking a new piece of research work ? Suppose a Deputy Director wants to start a piece of research, does he start straight off or is the matter considered by a committee or referred to you for approval ?—There has been for sometime a sort of informal committee at the Dacca farm which discusses all the work which goes on at the farm ; but an officer is not fettered in any way when he wishes to bring forward a subject for research.

18177. Does he get anybody's approval ?—It is left largely to his discretion.

18178. Where does the Director come in ?—In general supervision and suggestion more than actual direct control.

18179. Suppose a Deputy Director went in for a wild-cat scheme ?—We could certainly stop that ; but nothing of that sort has yet occurred.

18180. Just one other question about this pest which I suppose, is of great interest to the Government of Burma, the Government of Bengal and probably to other Governments as well, this hyacinth pest. To what extent are the methods in actual practice dealing with this pest feasible on a large scale ?—There are three possible methods. There is man handling ; the second is by the use of machinery and third is by a chemical spray. Personally I think that a combination of all three will probably be most satisfactory.

18181. But they are all expensive and they all involve labour ?—Yes.

18182. Burma you know had a dredger at a cost of 3½ lakhs ?—I saw that reported. I do not know what the dredger did, whether it ever did any work. The Irrigation Department have taken over the rivers here in Bengal and they have (I believe, I am right in saying so) constructed some form of crushing machinery. The hyacinth is cut and conveyed through crushers and cutters coming out in a very fine state of division. It is then thrown over board. It has been tried on a very small scale ; but it has got to be proved whether it is a practical proposition on a large scale and whether a reasonable amount of machinery is capable of dealing with a very large amount of hyacinth.

18183. Do you not think, in view of its seriousness, it is a problem for concerted action ? It causes an enormous loss to agriculture directly and indirectly ?—I think in Bengal they have already come to the conclusion that without the collaboration of Assam and Burma, Bengal is practically helpless.

18184. Concerted action on the part of the Governments of Bengal, Assam and Burma is necessary ?—Yes.

18185. *The Raja of Parlakimedi :* Can it be used as manure ?—Yes, it is an excellent manure.

18186. *Sir James MacKenna :* It is an enormous problem ?—Yes.

18187. And it must be tackled in a very big way ?—Yes, it is responsible for doing a lot of damage.

Mr. Calvert : In Faridpur the area which has gone out of cultivation, or the cultivation of which is spoiled by water-hyacinth is estimated to be 5 per cent at the present time.

18188. *Sir James MacKenna :* It is getting to dry land ?—It ruins the deep water paddy.

18189. And of course the loss indirectly is increased because of the blocking up of easy transport by water-courses ?—It absolutely closes certain water-courses ; especially where the water is tidal the hyacinth comes down and then is brought back by the tide, and in the meantime other hyacinth has been brought down from the river from above, and in the end it piles itself up layer on layer, until it is solid enough for even a man or a bullock to walk across.

18190. *Professor Gangulee :* I want a little more information about this system of research that you follow. In answer to Sir James MacKenna you said that the Director, the Deputy Directors or your experts can pursue any piece of research without any consultation ?—Yes, normally.

18191. Do you discuss fundamental agricultural problems with your experts ?—Yes.

18192. Do you chart out a programme for a year, or two or three years ?—I do not think that is sound, I do not think you can say exactly what you can do in any one year.

18193. Not quantity but quality ?—We examine it, we look at the results. All the reports of the work done are read carefully and if necessary criticised. Then I pay frequent visits to the farm and to the laboratory, and discuss the work that is in progress with the different officers.

18194. Do you have any system of a colloquium to discuss these questions ?—It is nearly all informal.

18195. Is there any co-ordination between your Fibre Expert and the Economic Botanist, or between the Economic Botanist and the Agricultural Chemist ?—Yes.

18196. Is your Economic Botanist familiar with the nature of research being conducted by the Agricultural Chemist ?—The work on transpiration which I mentioned is being done in collaboration by the Agricultural Chemist and the Economic Botanist; similarly, the Fibre Expert and the Agricultural Chemist collaborated in very fruitful work on green manure.

18197. It is a sort of team work ?—Yes.

18198. To tackle one particular problem?—Wherever possible, it is work in collaboration.

18199. In retrenching your department, which has been rather serious, was the full value of your work carefully appraised ?—I suppose it was carefully considered.

18200. We therefore cannot come to this conclusion, that the items which were retrenched were found unnecessary by the Retrenchment Committee ?—Certainly not, I do not think so.

18201. They took into consideration the full value of your work ? Retrenchment was made only on financial grounds ?—Yes; it was absolutely necessary that some retrenchment should be effected.

18202. You have stated that you have no systematic soil survey. Is any systematic effort made for an agricultural survey ?—There is no systematic agricultural survey in progress at the present moment. Each Agricultural Officer has instructions to proceed as far as he possibly can in the direction of making a survey, to write up the results as he gets them, and to forward them to headquarters.

18203. On page 2, you say that the success of the Indian Central Cotton Committee has led to a suggestion that the principle of that Committee could be extended to other crops. Did this suggestion of carrying on researches by crops occur to you before it arose elsewhere ?—That was a thing which was discussed three or four years ago.

18204. Was this your suggestion ?—It was not mine.

18205. Did it arise in your mind independently of others ?—I do not think it did, but I forget now.

18206. On page 2, you say that under provincial control research may not prosper as it should. Could you develop that idea ? What have you in mind ?—In that I am merely looking to such contingencies as took place, for instance, under retrenchment. We were then handicapped seriously by lack of money, and the work of the department was held back for years.

18207. When you say "subject to the same influences," you were referring chiefly to financial difficulties, and not to anything else ?—Not particularly.

18208. Do you anticipate any difficulty from the politician ?—That is a possible contingency; I think that there might be some political influence.

18209. Turning to the work of the Deputy Directors, they are largely responsible, as I understand, for propaganda work ?—That is the main part of their duty.

18210. Propaganda and demonstration connected with propaganda ?—Yes.

18211. They are also in charge of research ?—They are nominally in charge of such research as is going on in the farms.

18212. You have got 19 farms; how many experimental farms are within the jurisdiction of each of the Deputy Directors ?—Seven or eight farms.

18213. So, the Deputy Director has to look after the farms, do his propaganda work and demonstration, and carry on his own research ?—Yes.

18214. Do you think it is humanly possible to do all that efficiently ?—We want to get a Deputy Director in each division; that would reduce his number of farms to four or five.

18215. You receive a certain grant from the Indian Central Cotton Committee ?—No.

18216. Your Second Economic Botanist is working on cotton ?—Yes.

18217. Independently of any grant from the Indian Cotton Committee ?—Yes, it is local research.

18218. In Western Bengal there is a possibility of cotton cultivation ?—Yes.

18219. The research work done by Mr. Datta indicates that ?—The work which has been done indicates that there are some varieties which may do good there.

18220. With regard to your relationship with the Central authority in point of the research work which has already been accomplished by you, what definite assistance have you received from the Imperial research stations in Pusa, Coimbatore or elsewhere?—I do not know that we would ask, if we were doing a piece of research, for the assistance of Pusa particularly, unless we had not got the staff to do it. Do you want instances of where Pusa has helped us ?

18221. Yes ?—I will give you one instance. When we began to grow jute seed on a large scale in Bihar, in the first year we encountered a fungus disease which was so serious that we thought we would have to abandon the whole scheme of producing jute seed on a large scale in Bihar, but with the assistance of Dr. Butler, in the course of a very short time, we were able to come to the conclusion not only that this fungus was very widespread throughout the jute growing tract, but we could control it by steeping the seed in copper sulphate, and later, that we could evade the disease altogether by sowing it at a different time. The work was done in collaboration with Pusa, and it has been of very great value indeed.

18222. With regard to the jute breeding investigation, which you have just referred to, was not the work undertaken only after the recommendation of the Board of Scientific Advice ?—The work on jute was done at the instance of the Bengal Chamber of Commerce.

18223. Therefore, we may take it that the work did not arise from the Department, but that it arose from an extraneous authority ?—There was no such thing as a department at that time.

18224. The recommendation came from the Bengal Chamber of Commerce?—Yes.

18225. The matter went up to the Board ?—The matter went up to the local Government, and from the Government of Bengal to the Government of India, a sub-committee of the Board of Scientific Advice was appointed to investigate the matter.

18226. When was it taken in hand seriously ?—The work began about 1902. Of course, it had to begin with the collection of plants, and that was one aspect of course. There were various statements made in the market and elsewhere that the jute plant was deteriorating and producing a worse quality of fibre; that had to be investigated. Another aspect of the question was whether any improvement was possible. For the purposes of answering both these questions, a collection of fairly typical jute races was made from various parts in Bengal, and they were examined first of all as regards the quality of the fibre they produced. The result of that investigation was that if the preparation is careful and the plant is well grown, a good quality of jute is produced. The other side was the question of improvement. Of course, that was largely a matter of yield, making it a more efficient plant, and that was the work that the Department of Agriculture undertook as soon as it was established.

18227. Was this result that you have obtained today arrived at by selection or hybridisation, or both ?—I may say that the whole of the area under improved jute at the present time is from seed produced by selection. We have a number of hybrids, but none of them has quite come up to the best of the selected races.

18228. Could you tell the Commission the year when you obtained the two varieties of paddy of pure line selection ?—How many years back was it ?—Probably, about 1915.

18229. Has there been any further work on paddy breeding since ?—Absolutely constantly.

18230. The public constantly hear about *indrasail* and *kataktara* varieties ?—The *indrasail* and *kataktara* were two races of paddy which were specially selected for a very large tract in Eastern Bengal, Northern Bengal and Central Bengal; they were found not to be generally suitable for Western Bengal, on account of different physical and climatic conditions.

18231. When you say that the yield of these varieties is about 25 per cent above the ordinary races of paddy, would you ascribe the increase solely to the pure line seed ?—Yes.

18232. Irrespective of the method of farming ?—Yes.

18233. Or the type of soil ?—Yes.

18234. It is due to the hereditary function in the seed, irrespective of land ?—Irrespective of any environment.

18235. With regard to fibre experiments, have you any data on the influence of soil on the quality of fibre ?—In collaboration with the Indian Jute Mills Association we are in the middle of an investigation into that; it is a long story.

18236. I just wanted to know whether that point has occurred to you, because it is rather important. As you know, Canadian hemp has received a great set back because of the bad soil condition ? Have you conducted any experiments on retting ?—Yes, we have found that retting can be hastened.

18237. Of course, you know it is a bacteriological process ?—Yes, and the action of the bacteria can be considerably hastened by giving them suitable salts as nutriment. I doubt if that would be an economic proposition. To be successful in retting you ought to have a running stream, and if you are going to have a running stream, it becomes very expensive indeed.

18238. You have already given us some indication of your relationship with the paddy research station in Coimbatore. Did you pay a visit there ?—We have merely had samples of paddy from Madras to test them in Bengal. The reason was that in Madras they seem to be able to get a higher yield of paddy than we have hitherto been able to get in Bengal.

18239. *The Chairman :* Is it really the case that you have not been to Coimbatore ?—Yes.

18240. *Professor Gangulee :* You have visited the paddy-breeding station ?—No; I have not been to Coimbatore; I have been to Madras.

18241. We were rather interested in the kind of work that is being done there. One of their experiments interested me a great deal; they are doing some work on salt resistant varieties. Do you think it is very important here ?—We have also done it here. We have got a collection from Burma and Madras, the Sunderbans and Chittagong.

18242. Has Dr. Hector, who is in charge of your work here, come into contact with Mr. Illiffe of the Coimbatore station on any occasion in order to discuss these problems of paddy-breeding ?—I do not think so, unless they may have met at a conference. I do not know whether they have ever met.

18243. *The Chairman :* Do you happen to know the first class fare to Coimbatore ?—It would be about Rs. 130.

18244. *Professor Gangulee :* Have you sent any variety of paddy from here to Coimbatore ?—I could not say.

18245. One more question about research. In your report you give us results of manurial experiments. For how many seasons do you continue your manurial experiments before you put your results out ?—Many times. Many of them go on for years. The results quoted in one report are merely the results of the previous year.

18246. When you say ' previous year, ' do I take it that it is one year's experiment ?—These are only records and not the compilation of all the records.

18247. How long have your manurial experiments been tested ? After how many seasons' experiments have the results been obtained ?—They go on for years and years. Take the case of lime and potash. That work has been going on for a number or years. It was fit to go out to the cultivators some time ago but we have not yet been able to get the necessary financial assistance.

18248. When you definitely recommend that phosphate is good for certain crops on red soils, how many seasons' trial do you actually make in your experiments before you arrive at a conclusion ?—I would not like to give any particular number of years. It would probably be at least three, possibly four or even five. It all depends on the results themselves and how they agree.

18249. With regard to Agricultural Education. In the note that you have submitted you tell us, with regard to this proposed Agricultural Institute at Dacca, that the preliminary training in pure science should be followed by two years' practical work at Dacca farm and the qualification for admission in Intermediate (science) standard ? —Intermediate science *plus* one year in science.

18250. What is the entrance standard for your Dacca Institute ?—It is Intermediate science *plus* one year in pure science at the University.

18251. That is your entrance qualification for the Dacca Institute ?—Before a student can come to the Institute to take his diploma course, he will have to take the Intermediate science *plus* one year in pure science at the Dacca University. Then he will begin the purely practical course at the Institute.

18252. The annual report of the department says, "It has now been proposed that Matriculation shall be the entrance standard." Which is correct ?—Do you not remember that there was a discussion last June, I think you were present at the meeting.

18253. In reply to our Questionnaire you say that the entrance qualification will be Intermediate science standard and in this report I find the Matriculation standard. I want to know which is correct ?—It has not been decided; it is still under discussion by Government. I think it would be a great mistake to admit a Matriculate to a course like the one we are contemplating at the Institute. It is a purely practical course and it assumes a certain knowledge of scientific processes. The average Matriculate does not know science at all.

18254. You have in your note referred to the failure of the Sabour College. What inferences, do you think, might we derive from that failure ?—I think the first deduction is that for the present (I do not prophesy at all, because I believe that conditions will alter in the future) an agricultural college must be started and filled almost entirely by people who are going to enter Government service. Later on it will be different, I believe. But for the present I think that we must contemplate that.

18255. The entrance qualification in the case of Sabour College was Matriculation ?—Yes.

18256. Your idea in the proposed Dacca Institute is to have more of the practical than of the theoretical aspect of agriculture ?—It will be entirely practical.

18257. You propose to teach pure science in the first year or for two years ?—We propose to teach pure science in three years.

18258. Then put the pupil through a practical course of training ?—Yes.

18259. Your idea is to keep these two aspects quite distinct. You do not think the combination of the two, practical and theoretical, may be successfully carried out ?—Our experience was very unfortunate. It may have been due to the fact that they did not have sufficient time. We have considered this very very carefully and we have come to the conclusion that it would be better first of all to make the boy understand a certain amount of pure science, sufficient to enable him to follow the scientific cases of the practical processes that he is to carry out later on.

18260. So you are definitely of the opinion that the purely scientific aspect should be kept distinct from the practical aspect ?—Personally I think so. But it is going to be tried only as an experiment which I am sure is going to succeed.

18261. Have you had experience in any of the European Universities where they teach agriculture ?—I have never taught at any such place, but I have been a student there.

18262. Have you had occasion to visit any such institute ?—Yes.

18263. Let us come to the secondary stage. In your secondary stage the model is the Punjab ?—In the middle school education, yes.

18264. Have you visited the Punjab yourself ?—I have not, but Mr. Mclean was a member of a small committee which visited the Punjab to investigate the Punjab system.

18265. You base your scheme solely on the success of the Punjab scheme ?—No. We have experience of two schools, one of which is at Amarpur in the Burdwan district. It really has been a success. There are eight schools in Bengal at the present moment which have agricultural classes. It is not only because this scheme has proved a success in the Punjab that we are going to adopt it in Bengal, but from our practical experience here. We have very few vernacular middle schools in this Presidency so we must apply it in the middle English schools.

18266. Do you know that middle vernacular schools are now on the decrease ?—Yes.

18267. Even the peasants do not like their sons to be educated in purely vernacular schools ?—Apparently so.

18268. With regard to the question of propaganda as to seed distribution, it is not quite clear what actual method you follow in your seed distribution ?—We followed rather direct methods both as regards paddy and jute. We went out to the districts and sent our officers out. We also sent out notices to the prominent people who could read; to panchayats and so on, and told them that we intended to distribute jute seed. We said we would distribute a quarter of a pound to each cultivator, on the condition that he would not cut the resulting crop until the seed was ripe and that he would grow the crop separate from his ordinary crop. Of course, we did not launch out into a huge scheme without testing it on a small scale first. At first we worked on a small scale. When that was successful, we proceeded on a bigger scale. It is that system which is responsible for the large area which is under departmentally improved jute areas.

18269. This 3,000 maunds of departmental jute seed is grown on that method ?—That was produced in Bihar. It was not grown on that method.

18270. I should like to know from where you have got this 3,000 maunds of jute ?—Largely from Bihar, partly from Assam and to a certain extent from Nadia district.

18271. So these three areas supply these seeds ?—Yes.

18272. Are they under your control ?—A contract is made with growers in these areas to multiply seed with which we supply them. We take the seed so produced at a fixed price, provided it germinates 90 per cent and is clean and that the crop from which it is raised is subject to examination in the field.

18273. When you say "departmental seed," you mean to say that the original seed came from the department ?—All the seed distributed or sold by the department is that of pure line types purchased by the Government Fibre Export. We supply growers with seed of these types for multiplication.

18274. You buy the seed from them on tests for germination and purity ?—Yes, it is examined for purity while growing.

18275. You think by that means the standard of excellence which you have attained is safeguarded ?—Yes, we test the seed; we take samples from each bag and test it to see that it is pure.

18276. Is the same process adopted with regard to rice ?—We started the same process with rice, but it was a much more difficult problem, and besides, the quantity that we had to distribute was much larger, and the arrangement involved the return of an equal quantity of the seed after harvest. It was found that that led us into all sorts of difficulties; I mean there were outstandings which were not recovered and we had great difficulties; in the end we had to give it up. Now we have gone on to another system which involves the use of small seed farms in villages; I mean we go to a particular tract where we know the conditions are suitable for one of our paddies, we select an important person in the village who has a considerable amount of land, and we get him to start a small paddy seed farm. The produce of that farm is then exchanged with the ordinary seed which the cultivators would otherwise sow; if there is any difference in price between the two, the department is prepared up to a certain limit to stand the loss as a demonstration charge.

18277. Of course, you have no machinery to test the purity of seed as they have in England and other countries, as to germination, purity from weeds, and that sort of thing ?—I do not agree and I think that no purer and better seed is to be found anywhere than that purchased by the Bengal Agricultural Department. The contents of every bag are tested; if it is dirty the seeds are winnowed and the charge is placed to the debit of the producer.

18278. With regard to the demonstrator who visits the various rural areas, would your demonstrator accompany the cultivator to his farm, walk over the land, point out errors of management and so forth, and have a chat with him ?—Yes, certainly; that is supposed to be his duty.

18279. Is this idea of the demonstrator going over his farm and discussing matters with him popular with the cultivator ?—It is becoming so now; I mean we can see things moving; there are definite requests for help now.

18280. *The Raja of Parlakimedi :* That depends also upon the demonstrator himself ?—Yes, and the people on the spot; they are the whole problem.

18281. You must give a good District Agricultural Officer a good demonstrator ?—The District Agricultural Officer himself is all that is necessary, because he will see that his demonstrators are good.

18282. *Professor Gangulee :* Of your 19 experimental farms how many are both experimental and demonstrational ?—Practically all of them combine both functions.

18283. Who holds the demonstrations in these farms, the Agricultural Officer or the Deputy Director of Agriculture ?—What we call a demonstration area is an area which is farmed in an ordinary way, I mean as an economic proposition.

18284. But I have not quite understood what part the Deputy Director of Agriculture plays in the demonstration work. When you hold a demonstration, is he present ?—Yes; but not always of course. A crop demonstration is a comparatively static thing. He is in charge of all the farms and of the demonstrators ultimately.

18285. Does he talk with the cultivators ?—Yes, certainly. I mean he cannot be in any one particular spot all the time; he has to go on tour, and when he goes on tour it is part of his duty to meet the cultivators on the spot.

18286. This idea of running your farms on an economic basis as a commercial proposition is a new one, is it not ?—I should think it is about four years old and of course it only refers to a portion of each farm.

18287. It has been recently organised ?—Yes.

18288. Many farms have not adopted that system, for example, Bankura ?—Yes, Bankura and Suri are two farms which we regard for the present as being too important from an experimental point of view.

18289. When you work out the cost of cultivation do you take the minute details ?—Yes.

18290. The number of hours ploughed and so on ?—Yes.

18291. *Mr. Calvert:* Mr. McLean, on this problem of fragmentation of holdings, do you regard the question of consolidation in Bengal as hopeless or just a matter of time ?—Very nearly hopeless, I think.

18292. You said that a committee had been proposed to investigate the matter; has that committee been appointed ?—No, the committee was never appointed.

18293. You have visited the Punjab ?—Yes.

18294. Have you any alternative method to suggest ?—No, I am afraid I have not.

18295. Or any improvement which we could consider ?—No, I thought the Punjab scheme was very excellent; unfortunately we cannot apply it here.

18296. The difficulties of tenure are too great, are they ?—That is the trouble, the tenure of holdings.

18297. Mr. Finlow, in discussing fertilisers you say that the improved crops mean an appreciably greater drain on the soil, which must be replaced ?—Yes.

18298. That is almost in direct conflict with what Mr. Howard told the Indian Science Congress last January ?—I think it is patent. Suppose you take a jute crop; a jute crop grown from improved seed produces say 3 or 4 maunds an acre more fibre. The fibre in the jute plant varies from 4 to 6 per cent of the plant, so that the total green weight of the plant would be say 20 times that amount, which would mean an extra 60 maunds, or 2 tons, of green matter per acre. In the preparation of the fibre practically the whole of that material goes into the water and is washed away.

18299. In discussing attracting capital on page 14 you say it is probable that the aggregate income per acre from large farms would be less than that from holdings farmed intensively ?—Yes.

18300. Is that based on experience or is it just an opinion ?—It is the difference between farming extensively and farming intensively. Theoretically of course it should be possible to cultivate a large farm to the same degree of efficiency as it is with a small farm, I mean, for instance, a garden; but in practice I do not think it happens. I mean if you have got a small area of one acre, you can put manure and labour into it, and it is more possible to do it on a small area or on a large number of small areas, than on one big area with comparatively few people working it.

18301. On the other hand it is argued that on the larger farm there is more scope for capital, labour-saving machinery, intelligence and skilled direction ?—Not necessarily. I mean, as regards manure, provided there are credit facilities, there is no difference between the large farm and the small one.

18302. That is one of the contentious points from the economic point of view; I was wondering what your experience was. (*Mr. McLean*). You can grow intensively certain crops which are very paying, whereas you cannot grow them extensively. It means that you are increasing your aggregate return per acre.

18303. You assume that a large farm means extensive cultivation ?—Yes, it must do, surely. A large farm means extensive cultivation as apart from intensive cultivation.

18304. *Mr. Gupta:* Must it necessarily be so ?—Not necessarily, but in practice it would amount to that I am sure.

18305. *Mr. Calvert:* I do not know what variation of holding there is in Bengal, but does your experience indicate that your small cultivator does actually cultivate more intensively than your bigger cultivator ?—We have not got any big cultivators in that sense; I mean five acres is about the limit taking it as an average. There are individuals in places who cultivate more, but I think it is safe to say that the average is within five acres.

18306. The most remarkable thing about most of India that I have noticed is that the small man tries to cultivate extensively, he cultivates the same crops as the big man

and uses the same method; the 2½ acres man will grow rice in exactly the same way as the 15 acres man? I think the small man is able to do more.

18307. Yes, he is able to, but does he ?—Well, there are more men to the acre, to start with, as a rule.

18308. Does not that generally mean, more leisure to the acre ?—It might; of course that is putting it in another way; but I think you will find it goes into labour.

18309. But he actually grows the same crops ?—Yes, probably; but on the other hand jute grown as a plantation crop on a large area has always failed hitherto over the labour difficulty.

18310. In discussing the welfare of the rural population, you mentioned the Punjab Board of Economic Enquiry. Is there any proposal to establish a similar Board here ?—There is no official proposal.

18311. Do you think you would be able to get people sufficiently interested in rural problems to manage such a Board ?—I think so, yes. I think we ought to be able to do that. In fact, I am sure there are people in Bengal sufficiently interested to devote a certain amount of time to it.

18312. Am I to understand that your department has given a monopoly of the distribution of jute seed to a particular firm ?—No; just for the present Mr. Godden is Government agent for jute seed because Government said that the distribution was a scheme which was becoming too big for the Agricultural Department with its small staff to manage; and then we received an order that we should appoint an agent for the sale of Government jute seed.

18313. Suppose the Co-operative Department asked for seed for distribution ?—They would get it immediately.

18314. Through you or Mr. Godden ?—They would get it through Mr. Godden but at the same price as we should supply it to them.

18315. You say that this seed is at a premium over the ordinary seed ?—Yes.

18316. Does not that open up an opportunity for private individuals to grow this special type of jute for seed ?—Yes, certainly, and we take the seed provided we can supervise its production. It has also produced a number of imitators, I am sorry to say.

18317. You mean who are not adhering strictly to the advice ?—People who are selling other kinds of seed as improved seed.

18318. There is no one trying on scientific lines to produce this high class seed as a private venture ?—Yes. All our supply of improved seed is produced by private growers, whom we supply with pure seed for multiplication.

18319. Do they sell it themselves ?—So far, all of them have said they would prefer we should do the selling of it, because they cannot be worried with collecting the small amounts of money; they do not like to take the risk either.

18320. I should like to ask you a few questions on the effect of a large market like Calcutta on agriculture round about. Does the cultivator round about Calcutta respond to the economic opportunity afforded by Calcutta ?— I think he does to a considerable extent. Take vegetables; we have big areas round Calcutta where vegetable cultivation is practically the sole occupation of the cultivator. The village of Padmerhat, which it was suggested the Commission should visit, is an instance in point.

18321. The cultivator is using more improved methods of cultivation ?—Yes.

18322. May be using more intelligence ?—They use more manure than the ordinary cultivator.

18323. Is that opportunity being seized by educated people to go in for market gardening ?—I do not think so; it is nearly all done by the small man.

18324. By the men of the same educational attainments as the men fifty miles away ?—Yes.

18325. Are the facilities for transport round about Calcutta sufficient to extend this area ?—Cauliflower comes to Calcutta from Patna, nearly 400 miles away. There are various places which have gardens outside Calcutta, which produce their own vegetables. Then there is one farm at Ranaghat, about 40 miles from Calcutta where they produce chewing cane, also vegetables and they sell them in Calcutta. I should say however that, on the whole, vegetable cultivation is in the hands of small men.

18326. Are potatoes grown round about Calcutta ?—Yes; there is a big area in the Hooghly district and in the Howrah district.

18327. Taking again this Calcutta example, is the food supply per acre derived from the neighbourhood of Calcutta more than from the cultivation of paddy ?—I should think so, certainly. There are more crops to grow.

18328. Have you looked into the question of comparative food supplies obtainable from fruits and vegetables as compared with paddy ?—Not in detail. I think I have mentioned in some of my notes that it would be possible to increase the number of crops in the course of a year.

18329. *Sir Ganga Ram :* Is there much scope for the potato to replace paddy ?—No ; potato is a cold weather crop and paddy is a rain crop, except *boro* paddy which grows on land where potato could not be grown. Paddy is either sown in June or transplanted in July or August.

18330. *Professor Gangulee :* You do not grow potatoes in the hot weather ?—In the hills it is a hot weather crop.

18331. What do you mean by "hot weather crop ;" crops which mature in the hot weather or are sown in hot weather ?—In the hill the potato is lifted about September, October and November.

18332. That is in the hills ?—Yes ; it would be ready for lifting in the plains about February.

18333. *Mr. Calvert :* From your experience can you say whether the people hereabouts, not the Europeans but the Bengalis, are taking to potatoes and English vegetables ?—Yes, I think so ; especially potatoes, cauliflowers and cabbages.

18334. There is a tendency to a change of diet ?—Yes.

18335. *Dr. Hyder :* Among the ordinary cultivators ?—I think among the ordinary cultivators too now.

18336. *Mr. Calvert :* On the small holdings you have here, 2 to 2½ acres of paddy, do you think there is any hope of extricating the cultivator from his poverty by any considerable improvement in paddy alone ?—If he is just a paddy cultivator and nothing else, it is going to be a very, very difficult problem indeed.

18337. Most of your people are purely paddy cultivators ?—No.

18338. About 23 million acres out of 31 million acres are under paddy cultivation ?—They sow paddy or jute, reap it, and then follow by transplanting paddy. That is a double figure.

18339. Twenty-three million acres include double crop paddy ?—Yes ; two crops. Over a large part of the country in Eastern Bengal, over Mymensingh which is the biggest district, and over a great proportion of Northern Bengal there is a rotation. It is either jute followed by transplanted paddy, or broadcast highland paddy followed by transplanted paddy. The jute replaces the broadcasted highland paddy.

18340. Jute is only 10 per cent ?—It is one-seventh.

18341. And paddy very much more than that ?—Paddy is enormously greater ; yes.

18342. We have been hearing a certain amount of interesting evidence about rural dietary, and we have been told that rice diet has to be helped by pulse. In your last report you have nothing of importance to tell us about your work on pulses ?—No.

18343. Do you think the commercial value of jute is distracting attention from the food crops ?—I do not think so. It is a different section altogether. The work of pulses and oil-seeds is in the hands of the Second Economic Botanist.

18344. *Professor Gangulee :* He is also doing cotton work ?—Yes.

18345. *Mr. Calvert :* There is one final question. Is there anything in the Bengal rice straw which makes it unsuitable for pulping for paper ?—I should not think so ; but it would never do ; if you consume large quantities of rice straw for paper your bullocks would go short.

18346. *Professor Gangulee :* Your point is there is no surplus straw ?—I think not. I have not made an exact calculation of the quantity of straw produced.

18347. *Mr. Kamat :* In answer to a question from one of our colleagues, about waste lands, I gather you said that they are not suitable for being brought into cultivation ?—Yes.

18348. I find that in this Presidency the land classified as not available for cultivation is extraordinarily high. Out of 49 million acres of total cultivable land, land not available for cultivation is 10 million acres ?—That includes rivers, lakes, roads, everything. The actual area of so-called cultivable waste is 6 million acres. I think that is too high.

18349. On page 3, Agricultural Statistics of Bengal, 1924-25, you have shown separately 6 million acres as "cultivable waste." You have also shown 4 millions as "forests," and excluding these you give 10 million acres and odd as "not available for cultivation." I want to know how this calculation is done ?—The area of 10 million acres not available for cultivation is land which could not be cultivated such as village sites, roads, rivers or anything of that sort.

18350. *Sir Ganga Ram :* And the area under urban population ?—Yes ; that also.

18351. That means that there is only 6 million acres of waste land ?—Yes, 6 millions of cultivable waste.

18352. *Mr. Kamat :* It seems a curious phenomenon in this Presidency, that there should be such an amount of land classed as "not available for cultivation," and you are still having a sort of migration of labour to so-called more fertile lands in Assam ?—They are more fertile.

18353. So that, they leave alone the lands in their own Province and go to some other Province ?—Yes.

18354. *Professor Gangulee :* What is the quality of this waste land ?—The typical land would be somewhere near Suri in the Birbhum district ; it is high land. That would be one type.

18355. Laterite soil ?—Yes ; it is soil of that kind ; acid.

18356. Deficient in phosphates ?—Deficient in most plant ingredients.

18357. *Mr. Kamat :* Turning to page 6, Agricultural Indebtedness, you say, "In Bengal too the price of rice has continually appreciated." In these respects the cultivator is probably more fortunate in Bengal than in other parts of India ?—That is correct.

18358. Now, in another leaflet supplied to us, the memorandum by the Director of Land Records, about subsistence holdings, we are told, "Taking Bengal as a whole we may take the average net income from agriculture to be Rs. 52 per acre." Your statement is that the cultivator of Bengal is better off than in other parts of India. Taking those statements together I should like to ask you whether you consider an income of Rs. 52 per acre to be so substantial as to be characterised as very favourable to the cultivator?—I regret I have not seen the leaflet supplied by the Director of Land Records. If you take the jute districts, the average ought to be considerably higher than that. If the figures for the yield of rice, for instance, are any thing like correct, it ought to be higher than that.

18359. It ought to be higher ?—Yes, taking the yield for rice and for jute, it ought to be higher than that.

18360. Now let me come to my own point. I was asking you if you really considered the cultivator to be well off, why should he migrate to Assam leaving his own lands and his own home here ?—He is leaving the worse parts of Bengal for better land elsewhere. There is a tract in Eastern Bengal in the Mymensingh district and also a smaller tract in Sylhet where he is worse off.

18361. *Dr. Hyder :* Is there any large migration of Bengal labour to Assam ?—Not of labour as far as I know. It is migration of settlers. The figures were given some years ago as 10,000 a year, I believe, and they have increased since it has to be remembered that the population of Eastern Bengal is very dense.

18362. You have industries in your Province. The Bengal labourer does not go into the mines ?—No ; he does not like to do that.

18363. *Mr. Kamat :* To continue my argument, what I am unable to reconcile is this. If you consider the ordinary cultivator in Bengal to be well off, why does he migrate ? Is he fond of leaving home ?—He does not migrate from the districts where he is well off. The migration is not from Eastern Bengal except from the Madhupur jungle area.

18364. *Professor Gangulee :* You just now said that 10,000 people migrate from Mymensingh ; that emigration is from Eastern Bengal ?—It is from parts of the Madhupur jungle tract possibly from Sylhet.

18365. Not from the producing area ?—No.

18366. *Mr. Kamat :* On the same page dealing with agricultural indebtedness you say that the profits from jute, taking the year 1925-26, were Rs. 200 or more per acre. That is to say, a family of four people with a holding of about 4 acres would make about Rs. 800 net profit, is that so ?—If they had 4 acres under jute.

18367. Even taking 2½ acres, which is your average, it would be Rs. 550 ?—The price of jute last year was very high ; it was about Rs. 17 a maund on the average and probably higher in some tracts.

18368. So the illustration you have taken here is an extreme one ?—Yes; it was for last year only and this is definitely pointed out in the note as the effect of record prices in reducing indebtedness.

18369. Will you please give a rough idea of the net profits ?—Roughly Rs. 100 as a minimum and Rs. 200 in a considerable number of cases. This refers to 1925 only.

18370. This paragraph gives one an idea that it might be Rs. 200 on an average. Now I come to the next point. You had in this Presidency a Committee appointed to consider the unemployment of the *bhadralog*. What was the finding of that Committee ?—One of their recommendations was in regard to agricultural education in schools, so as to bring the people back with an idea of agriculture and there were suggestions for, I believe, a colony in the Andamans.

18371. If in your opinion the net profit from jute is Rs. 100 on the gross return Rs. 200 per acre and if sufficient publicity is given to this fact to the *bhadralog* why do you think jute cultivation is not taken up by the *bhadralog* middle class of this Presidency ? Can you explain that ?—The year 1925 was granted as a period in which reduction of debt took place and not as an indication of the average profits on jute cultivation.

18372. Therefore in that case a statement like that, that the profits on the sale of jute in a particular year were Rs. 200 per acre, would be rather misleading to the public, or in the alternative you must be able to attract a good many of the *bhadralog* to this industry ?—I should like further to examine the figures; but I do not agree that the statement, as made, is misleading.

18373. *The Chairman:* Perhaps you would like to put in a considered statement as regards the net profits in jute growing for a series of years; it is very little use answering questions of detail without such figures ?—Yes*.

18374. *Mr. Kamat:* Passing on to another point, you told us that you had here a Department of Fisheries and that it has been closed. Would you give us the reasons why it was closed ?—It was closed on account of retrenchment for the same reason as the Agricultural Department was retrenched.

18375. Purely as a result of retrenchment ?—Yes.

18376. But till then, till the retrenchment came in, were the trials you made with fisheries hopeful ? Did they show signs that this industry would be a successful and promising one in this Presidency?—There was a fair indication that pisciculture might be a very useful subsidiary industry.

18377. I take it therefore that it was a hopeful industry as a secondary occupation, but considerations purely of retrenchment came in the way; it is well worth taking up this question again if the conditions are suitable and if the money is forthcoming ?—I think so, yes.

18378. May I know how much in your Presidency you spend on your Department of Agriculture ?—The present year's budget is for about Rs. 9½ lakhs.

18379. Only for the Agricultural Department and not for the Co-operative Department also ?—That is for Agriculture and Sericulture.

18380. *Professor Gangulee:* What was the figure before the retrenchment came in ?—It was approaching 12 lakhs. The last year before retrenchment I think it was over 11 lakhs.

18381. *Mr. Kamat:* What is the total revenue of your Presidency ?—I cannot tell you straight off.

18382. It is about 10 crores, if the Administration Report is to be taken as the authority ?—I think it is more than that.

18383. Say about 11 crores. Do you know how much your land revenue is ?—That I cannot tell you.

18384. It is about 3 crores and odd. Now in a similar Province, with a similar population, I mean Madras, the land revenue is more, about double yours. I want to know whether the question of fisheries could not be taken up again if you find that you are not spending much on agriculture ?—Government does intend to revive the Fisheries Department at the first opportunity. In fact, proposals have already been asked for.

18385. Now to come to your possibility of increased net income by following your agricultural improvements. In this leaflet we are told that the ultimate possible increased net income from jute if improved seed were distributed on a very large scale, would be something like 5 crores per annum. Similarly for rice the extra wealth for your Presidency would be about 3 crores ?—Yes.

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* Appendices I and II.

18386. I take it that you have made these calculations very rigorously ?—We have calculated on the basis of the income which we found would be realised over a large tract of the country, I mean over experiments done in a large number of places throughout the country taking the average.

18387. *Professor Gangulee :* On the basis of net income ?—Yes.

18388. *Mr. Kamat :* As a matter of practical experience I ask you, although things look very rosy in the laboratory or on a smaller scale in the field, still as every one who is concerned with district experience, knows, profits are very difficult to realise when you do things on a large scale ?—The calculation is not based on calculations made in the laboratory or as a result of trials on small experimental plots but on the results obtained by cultivators themselves who are applying the improved seeds on a very large scale.

18389. Have you calculated the whole thing on a very strict conservative basis ?—I think the basis on which we made the calculation was conservative. As far as I remember we put Rs. 7 a maund for jute, for instance, which is a very low price.

18390. I take it then that your calculations are very carefully done. The next question, therefore, is if there are immense possibilities of unearned increment in jute and rice alone and if, on the other hand, you cannot expand your land revenue owing only to the permanent settlement ; is there no possibility of having a cess on jute and other things so as to increase your income and improve the Agricultural Department ?—There is already a cess on jute.

18391. I know ; but is that a sufficiently adequate cess in view of these figures ?—If we can get an extra amount, we shall not be very long before we make very rapid progress in that direction.

18392. In some form or other, do you or do you not feel that this Presidency is not taxing itself sufficiently for agricultural improvement in view of the possibility of 8 crores of wealth which you promise us in the shape of extra income to the people ?—The sooner we get the men the better and I suppose men mean money.

18393. *Rai Bahadur Bannerji :* In giving evidence this morning you told that the research work was being done at Dacca to a very great extent and at Chinsura to a very little extent in regard to paddy and similar things. Do you not think that for Western Bengal a greater amount of research work should be done at the Chinsura farm ?—I do not think that I said that very little was done there. I said that Dacca was the main headquarters station and a lot of work on paddy was being done there and also at Chinsura. The work at Chinsura is the work which is suitable for Western Bengal. I should add that the two farms at Suri and Bankura are now being used to a considerable extent to reinforce Chinsura as far as the work in Western Bengal is concerned.

18394. Do you think that full justice is being done to Western Bengal as regards research work ?—I think so. Formerly of course as I pointed out this morning, there were two Provinces, one Eastern Bengal and the other Western Bengal ; our department commenced work on Eastern Bengal, and naturally worked on Eastern Bengal problems. When the Provinces were united, Western Bengal was behind Eastern Bengal. Now a great deal of attention is being paid to Western Bengal simply because in the past Western Bengal had to be neglected.

18395. Is it not being neglected even now ?—I do not think so ; there is a great deal of work being done at Dacca in connection with Western Bengal as well as at Chinsura.

18396. The soil of Western Bengal varies greatly from the soil of Eastern Bengal, and the nature of the crops also varies ?—Yes.

18397. Does it not follow from that that the nature of the research work meant for Western Bengal will be also quite different from the research work for Eastern Bengal ?—Not necessarily. I think that, speaking generally one would say that plant breeding should be done on the spot, *i.e.*, at Suri and Bankura for the high lands and at Chinsura or Burdwan for the deltaic tract. For soil analyses more can be done at Dacca though field tests would have to be made at Suri or Bankura.

18398. Do you think that each district farm in Western Bengal will be a centre of research ?—I pointed out earlier in this discussion that each farm had to be used as a sort of local testing station, in order to make sure, before pushing the crops out to the cultivator that they are suitable.

18399. Do you think the present District Agricultural Officers are competent enough for the work ?—I think so, under the supervision of the Deputy Directors.

18400. In the course of your evidence you have said that in these district farms the villagers round about are supposed to go and see the results of demonstration works and learn improved methods of agriculture for their own use ?—Yes.

18401. What facilities are being given to them for that purpose ?—The facilities that are being given are that the District Agricultural Officer is not supposed to confine his whole attention to the farms. He and his demonstrators are supposed to go out into the villages and let the villagers know what things are being done, and if he has anything which he can recommend to the villagers, he is entitled to distribute small amounts of seed to reliable persons for trial or, if necessary, to conduct demonstrations on the spot.

18402. Are any other facilities given to the District Agricultural Officer for those objects ?—Yes. Of course. We have to increase the number of competent demonstrators, and then the problem will be simplified considerably.

18403. Where was this *dudsar* paddy, which has just been introduced into Western Bengal and with some success perhaps, experimented upon ?—That was produced in Dacca.

18404. Have you already come to the conclusion that it is well suited to Western Bengal? It suits the *barind* tract in the Rajshahi Division and the higher tracts of the laterite area ; the results are not definite enough for Western Bengal at the present moment ; but *dudsar* is being tested against other strains now being evolved at Suri and Bankura.

18405. As to the question of the average holding being 5 acres, is that a right conclusion ? If we take all the holdings of the whole Presidency of Bengal into consideration, do you come to the average of 5 acres ?—I do not think I should ; I have not sufficient figures by me to make an average.

18406. The average will be much larger than that ?—Much larger.

Mr. Calvert : The cultivator's or owner's holding ?

18407. *Rai Bahadur Bannerji :* Cultivator's holding in Western Bengal ?—In Western Bengal it is so. Here are some figures in the Director of Land Records' notes ; 2·51 acres in Backarganj.

18408. *The Chairman :* Being the average ?—The average for Backarganj district.

18409. In Eastern Bengal ?—Yes. In fact, it is still less ; 1·39 acres is the size of the ryot's holding.

18410. *Rai Bahadur Bannerji :* Do you not think that a central farm at Calcutta or near about Calcutta at Jadabpur or some such place for the research work that is necessary for Western Bengal will remove a great want of Western Bengal ?—Would you have laboratories there ?

18411. Yes, of course ?—Duplicate the whole thing ?

18412. Yes ?—It will mean very great expense ; we went into this question some years ago ; it amounts to lakhs of rupees.

18413. As far as I know, some lands at Jadabpur were acquired already, and they are lying fallow ?—I do not think land has been acquired at Jadabpur. We are acquiring land at Baraset. The advantage of a farm near Calcutta would be that the Calcutta people could go and see the work that is going on, which of course would be an advantage.

18414. While you were talking of roads this morning, you said that there were many roads in the interior of the districts ; is that a fact ?—I said the main roads ; away from that the roads vary enormously in quality.

18415. In Eastern Bengal perhaps the absence of the roads might be compensated by *khals* and rivers, especially during the monsoon, but in Western Bengal, all throughout the year, you have tracts of land which cannot be reached in any way. Does it not mean absence of roads altogether ?—As far as Western Bengal is concerned, it has not got rivers and roads are few. It is a difficulty that I myself found on tours in the rains.

18416. You have said in the course of your evidence that these sugarcane crushing machines are very popular ?—Yes.

18417. But other machines like harrows, ploughs, and tractors are not popular ?—Yes, quite so.

18418. Does it not mean that these machines are not quite up to the requirements of the cultivators ?—It might be that, but I think that an equal possibility would be that a firm like Renwick has not pushed them.

18419. *Sir Henry Lawrence :* About these statistics, do you think they are fairly accurate ? Is this figure of 10 million acres of uncultivable waste correct ?—It is very difficult for me to say so ; I doubt the accuracy of them myself.

18420. Where is the figure obtained from ?—It is obtained from the Collectors.

18421. Does it include all the water wastes in the Sunderbans ?—It includes everything.

18422. Forest and hills ?—Yes.

18423. You think it may be somewhere near correct ?—Possibly yes ; I have no means of checking it at all.

18424. As regards these millions of acres of waste, is that land that could be brought under cultivation ?—Some of it certainly.

18425. What prevents its being cultivated ?—It is merely the condition of the land ; it is poor land, and it requires a great deal of manure ; it is difficult to cultivate. If you take the portions in Western Bengal, the rainfall is irregular.

18426. *Professor Gangulee :* It has no facilities ?—It is a question of water largely.

18427. *Sir Henry Lawrence :* Is it land where the rainfall is small ?—It is not well distributed, the average is 55 to 56 inches. It is quite a common thing for the monsoon not to break until July.

18428. Is all the land that is capable of cultivation now being cultivated ?—A large proportion, I think ; I think these figures are misleading to that extent ; people may think that there is a considerable proportion of the area of the Province which is capable of easy exploitation.

18429. That is not so ?—I do not think that is the case. The difficulty of bringing these areas into cultivation would be very great, in regard to any scheme for placing the *bhadralog* for instance on waste lands ; I think it would be giving them a very, very difficult time indeed.

18430. It would require capital and skill ?—Yes. I do not say these lands are quite uncultivable ; they are more difficult than the average.

18431. Is there subsoil water available ?—Yes, at a considerable depth ; under some of them there is rock.

18432. Have you large numbers of landless labourers in this Province ?—I do not think there are large numbers of landless labourers in this Province. The landless labourers would be very largely, at any rate in Eastern Bengal, people from Bihar ; there is a big importation of labour there ; in Western Bengal there is the labour which goes to the coal fields ; I suppose that would be partly agricultural, and there is a great tendency for the labourer to leave the coal fields and go to the paddy fields.

18433. The Province imports its manual labourer from outside ; for the coal fields it imports, and also for Calcutta ; is that from other Provinces ?—Yes, and to a considerable extent also at times for the jute crop.

18434. You have already stated that the small cultivator in Bengal is in fairly comfortable circumstances ?—Yes.

18435. And these facts, that he is unwilling to go elsewhere for labour, support that view ?—Yes.

18436. To what extent did you suffer in retrenchment ? The figures in the last Budget indicate that your Budget has increased in the last two years from 10 lakhs to over 12 lakhs. What was it before the retrenchment ?—I do not think it is 12 lakhs ; that includes other departments. The Budget for this year is just under 10 lakhs.

18437. What does this figure here include ?—You will find that it includes other departments, such as Veterinary and Gardens.

18438. It includes Gardens. Do they not come under you ?—No, they are not under our control.

18439. Whose control are they under ?—Sibpur garden is under the control of the Director of the Botanical Survey.

18440. Excluding that, your figure is about 9 lakhs ?—Yes.

18441. How far have you been reduced ?—I cannot quite remember the figure. I think it approached 12 lakhs in the last year before retrenchment.

18442. Do you see any prospect of getting your grant restored or increased ?—I think there is hope of its increasing now.

18443. You have got schemes put forward ?—Yes.

18444. And you have reason to hope that they will be sanctioned in the next year ?—Yes.

18445. Now, in your farm reports, I see a considerable amount of attention is being given to a number of subjects like sugarcane and so forth. Can you give me any idea

as to what is the proportion of work done for paddy as compared to other subsidiary purposes ?—Paddy occupies practically the full attention of one section.

18446. What does that mean ?—It means that paddy is under the direction of Dr. Hector and his assistants.

18447. What proportion of the budget of your Department is spent on paddy and what proportion on the rest ? Is it half and half or one-third ?—It would not be half. It would, I think, be a third of the research work.

18448. Paddy represents two-thirds of the agricultural interests of the Province. You accept that figure ?—It is more than that.

18449. Have you attended the meetings of the Board of Agriculture in recent years ?—I did not attend the last meeting.

18450. Have you attended them in previous years ?—Yes.

18451. Has the question of improvement of paddy been discussed there ?—Yes.

18452. Are you acquainted with the experiments that have been made in Bombay ?—I am not, except what I have read in the reports. I have not seen the work.

18453. Bombay, Madras and you are working on paddy separately without any exchange of ideas on the subject. Is that the position ?—That is to a large extent true.

18454. That is capable of remedy, is it not ?—I think so.

18455. What has been the obstacle to prevent your being able to see Coimbatore ?—I do not think there is any real obstacle.

18456. *The Chairman :* It is not the travelling allowance ?—I do not think Government would have any very great objection on that score.

18457. *Sir Henry Lawrence :* Would you have to get special permission to do so ?—Yes.

18458. Have you ever asked for it and been refused ?—No. I think the main reason why Madras men do not come to Bengal to see the work or why the Bengal men do not go to Madras or to Bombay is because of the difference in the races of paddy. It is possible that some of them may suit all conditions, but generally it appears from our experience with the Madras varieties when they were brought here that they did not behave as a normal rice crop. They did not flower, for instance, in time and so did not give the grain.

18459. There may be great difficulties but you do not know them until you have tried them ?—I quite agree that there should be an interchange of ideas.

18460. You accept that the Coimbatore sugarcane is doing you some good ?—Yes.

18461. Can you tell me to what extent Coimbatore sugarcane is being spread now ?—The acreage of the Coimbatore sugarcane is very small ; we have just distributed it.

18462. Only 100 or 200 acres now ?—About that.

18463. But you expect to extend it rapidly ?—Yes, it should extend very rapidly.

18464. You have this Rangpur farm. Is that under you ?—Yes.

18465. It is not under the Veterinary officer ?—No.

18466. There you have certain half-bred strains ?—There are two strains. One is produced by the crossing of country cows and Hansi bulls and the other is an attempt to improve the *deshi* breed from within by selection.

18467. When you have these half-bred animals, do you distribute these bulls ?—Yes, we have done so.

18468. Have they done any good ?—They have been popular in some places and in other places objection has been taken to them on the ground that they are too big.

18469. Are you proposing to continue to distribute them ?—We have introduced the Thar Parkar strain in order to reduce the size.

18470. Then you get the double cross. Do you propose to continue their distribution ?—We have not done so, so far. We are observing the results.

18471. As to the quality of the calf ?—Yes.

18472. I see the off-spring of certain bulls were rejected because they had English blood in them. What is the reason behind that ?—The question of disease comes in there. Cattle with English blood in them are very much liable to rinderpest and other diseases.

18473. Have you lost animals in such cases ?—Yes.

18474. You cannot protect them by serum treatment ?—We can for rinderpest but not for other diseases.

18475. You are attempting by the distribution of these bulls to improve the milk supply. That is your main purpose ?—Yes, they serve the dual purpose of work and milk.

18476. *Sir Ganga Ram :* You say that your irrigated area from all sources is a little less than 1½ million acres and the total area is 29 millions. Do you know the famine formula that you must have ·4 of an acre per head protected ? It has been recommended by the Irrigation Commission and according to that calculation you ought to bring 16 million acres more under irrigation. Have you pointed out that to your Government ?—No. I do not think it would apply to Bengal ; but we nevertheless realise that irrigation can be of great value to Bengal.

18477. Have you studied the Irrigation Commission's report ?—No, I have not.

18478. When you say so much yield of paddy per acre, do you mean to say paddy with husk or without husk ?—It is with the husk.

18479. Then all I can say is that all your yields are miserably poor ?—I think they are.

18480. How do you account for it ? Even in irrigated areas as compared to the yields of the Punjab your yields are miserably poor. I will give you an instance. You say your yield of *toria* (mustard) is 6 maunds per acre ?—Yes.

18481. But your yield is 58 per cent., so it comes to 3 maunds per acre ?—Yes.

18482. Do you think it is worth while for any man to cultivate and get 3 maunds per acre. I will tell you where the defect lies. How many times do you plough the land before you put the seed in ?—Roughly six times.

18483. Both irrigated land and unirrigated land ?—All unirrigated. If irrigation were available the yield might be doubled.

18484. That is one reason for this low crop. Do you not think you can tap the resources of nature which contains 80 per cent. of nitrogen without water ?—That is a point that I have been pressing very strongly.

18485. That is to say, you have been pressing that the land should be turned over and then exposed to the air as many times as possible. Is that right ?—Yes, that is done to a large extent.

18486. Do you teach that process to the cultivators ?—The cultivators already do it to a very large extent.

18487. We never plough our wheat area under 12 times and sometimes even 20 times?—The Bengal cultivator does not plough so many times.

18488. Have you got any statement of imports and exports of your food produce ?—Our statements cannot be complete because there are no figures for imports and exports.

18489. Cannot you get those figures for your Presidency ?—They cannot be complete because there are no figures for imports and exports by rail, road and river. The publication was abolished as the result of retrenchment.

18490. The publication is no doubt abolished but each Provincial Government has its own records. After all, the Government of India publications are compiled from your records. Can you say that the money that a cultivator gets from jute is saved by him or does it go to import food ?—I think, on the whole, the jute cultivator grows enough paddy to live on it.

18491. And he saves the money that he gets from his jute, or does he spend it on buying the remaining food ?—It goes on other things. He lives in a higher way than the cultivator who does not grow jute.

18492. Is his standing higher than that of the other cultivators ?—Yes.

18493. His standard of life is higher ?—Last year the jute cultivators did make considerable sums of money and they did buy luxuries and expensive food and things of that sort.

18494. *Mr. Gupta :* Last year was very exceptional ?—It was very exceptional ; but on the average the grower of jute is better off than his neighbour who does not grow jute.

18495. *Sir Ganga Ram :* What is the scientific difficulty in the way of increasing the wheat area ?—In Eastern Bengal it is climatic. We have tried wheat in Eastern Bengal and it does not do.

18496. Is it climatic or is it that the soil is not suitable ?—I think it is climatic, it is too damp. What has happened is that the wheat that we have sown has become diseased with rust or smut.

18497. Cannot you find a seed which will resist disease ? What kind of wheat do you grow ?—We have tried a number of different kinds of wheat.

18498. Have you tried Pusa wheat ?—Yes, the Pusa wheat and some of the Western Bengal wheats.

18499. I find from the figures that you do not grow enough food. You import a lot of food. You import Burma rice ?—That is a very fluctuating quantity. On the whole, Bengal exports rice.

18500. But you do import rice from Burma ?—Yes, in varying quantities. Some cultivators of high class rice sell their produce and buy coarser Burma rice at a cheaper rate for consumption.

18501. You import onions from Madras ?—Probably, yes.

18502. I want to know what things you import and what you export ?—There is a big export of rice.

18503. Can you tell us any surplus food you export ?—There is a big export of rice, I think.

18504. Then why do you import rice ?—There is an export of rice up-country from Bengal; people in Chittagong and Barisal, where they grow a fine rice, want a coarser rice to feed themselves ; they prefer a coarse rice.

18505. What kind of rapeseed do you grow here ?—It is the red variety ; *toria* is one, and *rai* is another. Different varieties ripen from January to April.

18506. You know Bengal is a great place for *toria* ?—Yes.

18507. A large quantity comes from the Punjab to Bengal ?—Yes, but a lot of what comes from the West, *i.e.*, from Bihar and the United Provinces, is exported from Calcutta.

18508. Do you say it is imported from the Punjab and exported from Calcutta ?—I think Bengal exports seed from Bihar and the United Provinces from Calcutta.

18509. All the *toria* we can spare we export from Karachi ; that is the cheapest way ?—Large quantities of seed comes into Calcutta, possibly not from the Punjab, but from nearer tracts.

18510. I know it comes here, because I have been sending it myself, but I do not know that it would pay to re-export it ?—They extract the oil in Calcutta.

18511. Yes, I know that. Is there any lift irrigation here from canals or from rivers ?—No, very little ; but the *done* is used for *boro* paddy and for potato cultivation.

18512. Is there no possibility of that being done ?—There are possibilities, yes. That is what we are hoping to do as soon as we get our Agricultural Engineer.

18513. How far down is the ordinary water table ?—It varies from about 10 to 25 feet I should think.

18514. What area does a well command ?—I am probably wrong there ; in some parts of Western Bengal in the very high lands we have sunk a well and not got water at 45 feet, but then that was exceptional.

18515. But ordinarily how many acres can a well command ?—Very little.

18516. You could not tell me what is the discharge of a well ?—We have not carried out the experiments ; I have not got the figures by me but I could tell you what is sufficient to exhaust a well.

18517. Have you or the Irrigation Department made out a list of delta water required to mature each crop ?—That has been done, I believe.

18518. Where ? In the Irrigation Department ?—Yes.

18519. Do you grow tobacco for export ?—In Northern Bengal there is a large amount of tobacco grown for export to Burma chiefly.

18520. It is not the class of tobacco from which cigars or cigarettes are made, is it ?—No, it is too expensive for cigarettes ; it is too good. The Burmese pay up to Rs. 25 a maund for tobacco ; it is for the Burmese "torches."

18521. Have you taken a section of soil down to any depth ?—The sections have been taken from the sinking of tube wells ; we have got none of our own because we have not sunk any tube wells, but sections have been taken.

18522. Who has done it ?—The Eastern Bengal Railway could give you sections.

18523. Can you get a copy of them ?—I will try and get a copy, yes.

18524. So you have no subsoil water-supply yet ?—No.

18525. You are quite certain that those sections show that there are possibilities of sand-bearing strata ?—Yes, I think there is every reason to believe it.

18526. And you have laid down a scheme for that ?—There is a tube well about to be sunk on the Dacca farm now.

18527. *Sir Thomas Middleton*: You advocate the establishment of central advisory bodies on the lines of the Cotton Committee. Which crops do you suggest would be most important for such bodies ?—The pulses and the oil-seeds I think would both repay investigation, and possibly also jute and tobacco.

18528. I was wondering whether you had in mind an important crop like rice with the object of getting into touch with the work that is being done on rice in other parts of India ?—I think that would be a very sound thing. Our experience with strains of rice from much more tropical climates than Bengal, like Madras, has not been fortunate; but I think it is probable we should get a great deal of good out of such a committee on rice.

18529. On that point of the possibility of transferring strains of crops to new districts, is it not a general experience that new varieties should be raised in the districts in which they are to be employed ?—I should think so, yes, on the whole.

18530. Is not sugarcane rather an outstanding single exception ?—Sugarcane certainly is ; we have no alternative in the case of sugarcane because its flower is not fertile in Northern India. Besides sugarcane is propagated vegetatively and not from seed.

18531. Then you agree that not only must there be research on crops, but research on the same crop in different districts ?—Yes.

18532. You have drawn our attention to the important advances in technical methods and technical results that have been secured in the crops of this Presidency in the past twenty years. Now you are dealing with an illiterate but very sharp-witted peasantry ?—Yes.

18533. And you rightly conclude I think that the quality of the district officer and of the demonstrator is of supreme importance in Bengal ?—I do, yes.

18534. Now let us get to the question of the training required for these men. You have got altogether about 670 demonstrators at the present time ?—No, we have nothing like it ; we have only 90.

18535. I got the figure of 670 from one of your reports ?—That is what we are aiming at.

18536. Your object is to get a demonstrator for every 60,000 acres I think ?—One demonstrator for each police *thana*.

18537. There are 28 districts ; how many district officers have you got ?—At present we have 31 officers in that grade ; I hope, we shall very soon have 40.

18538. You have pointed out that the quality of your demonstrators was not altogether satisfactory ?—Yes.

18539. These demonstrators have had very little scientific training ?—Very little.

18540. On the other hand, you aim in future at getting the district officers up to intermediate standard, and then giving them two years special training ?—Yes.

18541. Would it be possible to grade district officers and demonstrators in the same grade, so that you might begin your young expert in the lower post of demonstrator to enable him to acquire experience, and only promote him to be district officer when he has gained experience ? Would it be possible to draw these two groups from the same class ?—I think the pay of demonstrators would be too small to attract men of the type and training of District Agricultural Officers.

18542. What is the pay of a demonstrator ?—Rs. 30 to Rs. 50 per month.

18543. What is the pay of a district officer ?—From Rs. 125 to Rs. 300.

18544. Rather than increasing the number of demonstrators would it not be desirable to aim at a somewhat higher pay, so that the district officer may always have served a time as a demonstrator before he becomes a district officer, so that you might select your district officers from among the demonstrators who have really made good ?—What sort of pay would it be ? I mean I do not think you would get District Agricultural Officers at less than the present pay ; as a matter of fact, I think their prospects should be still better in order to attract an even higher type of man.

18545. The difficulty I see is that a district officer on leaving an institution, however well he is trained, is really not fit for his work until he has got some experience in working a district ?—That is true.

18546. And one would like to see a scale low to begin with but showing substantial prospects of advancement ?—Yes.

18547. So as to attract into the service men of ambition and good quality ?—Yes.

18548. Do you think it would be advisable to introduce such a system for the training of your men ?—It is a new idea, certainly.

18549. I should suppose that whatever Bengal may lack it does not lack brains ?—No.

18550. You should have a sufficient number of well qualified men if the prospects were good ?—Yes.

18551. So far as I can see the prospects should be quite good, because you will have a number of superior appointments ?—Yes.

18552. As regards training for your specialists, you take the view that the specialist should have a post-graduate training before he is employed ?—I think so.

18553. On the question of extensive and intensive cultivation, I want to ask you whether you have any reason to suppose that under equal conditions of soil, a man cultivating 2 acres in Bengal would grow a bigger crop per acre than a man cultivating 4 acres ?—I was not thinking of a comparison between men holding 2 and 4 acres; I was thinking of men holding 2 acres and 50 acres.

18554. Your method of soil survey is by sampling and not by field examination. You were a Bangor student. I was wondering if you had been following the work done in Bangor in soil survey ?—I have heard of it; but I have not seen it.

18555. Their method is not confined to soil sampling; there is also field examination ?—We should do that too. .

18556. You are well aware that this is a slow and very expensive process ?—Yes.

18557. You note the effect of bone phosphates in red soils in Bengal, and you point out that rock phosphates produce no results or little result. Have you ascertained whether the value of the bone phosphate is in fact due to the phosphate; may it not be due to the nitrogen ?—No; I do not think it is.

18558. Has that point been tested ?—It has not actually been put to the test; but the increase has been too great.

18559. To attribute it to the nitrogen ?—Yes.

18560. When was water-hyacinth first seen in Bengal ?—I cannot say. In Eastern Bengal, I should think, about 15 years ago. It must have been in Calcutta long before that.

18561. Attention was drawn to it 15 years ago ?—Yes.

18562. Coming to your statistics, I think you are personally responsible for the issue ?—Yes, for the issue of the Season and Crop Reports.

18563. If you take the " area according to professional survey " (Table I. Agricultural Statistics of Bengal) and compare that with the corresponding " area by village papers," the figures are identical. That means the " village papers " area is taken from the professional survey; there are no independent village papers in Bengal ?—No.

18564. Are the two figures always identical in Bengal ?—These figures are furnished as a matter of routine by the Collectors of districts.

18565. Which they extract from the records ?—Yes.

18566. I do not see the object of giving the corresponding area by village papers in your table, although that is a heading adopted in the Government of India statistics. In Bengal the two are identical ?—I suppose it is done on account of the Government of India's orders that it should be done in this way.

18567. Now, for some details, take for example, the district of Burdwan. In your cadastral survey table, page 18, the total area is about 500,000 acres; in your agricultural statistics table, page 2, it is given as about 1,700,000. What is the explanation of the difference ? What is your area of Burdwan, 500,000 or 1,700,000 acres ?—It is down here as 1,700,000.

18568. For Bankura, page 18, the area given is 1,720,000 against 1,680,000 on page 2. The difference in figures is only about 40,000 acres ?—Yes.

18569. Now, how do these differences arise in the two surveys ?—I could not say ; the figures are given by the Settlement Department.

18570. How are such figures got at in Bengal ?—It is all done by the Settlement Department. They are all obtained by them in the cadastral survey of districts as they are carried out.

18571. Has each village got its complete village books ?—It has got a complete village map and a record of rights.

18572. *Mr. Gupta :* In those days the district surveys were not complete in all the districts.

18573. *Sir Thomas Middleton :* So that the statistical figures are correct for part of the districts and for the other part they are estimates. Is that the position ?—Yes.

18574. When do you anticipate that the settlement will be complete ?

Mr. Gupta : We have a programme ; it will take another ten years.

18575. *Dr. Hyder :* How many districts are there which do not possess district farms or demonstration farms ?—I think six. I can tell you exactly by reference.

18576. I only wish to draw attention to the fact that you would like every district in your charge to possess a district farm or a demonstration farm ?—Yes.

18577. You speak in your note of the disease of the betel-vine. Do you know whether that disease is peculiar to Bengal or does it prevail in other Provinces ?—It is not peculiar to Bengal. It has been found in the Central Provinces and, I believe, elsewhere also.

18578. Have you ascertained from people working in the Central Provinces or Madras whether they have been able to find out some effective remedy ?—They have not. We have made enquiries. We know the disease in Bengal corresponds to the disease in the Central Provinces.

18579. It is the same disease ?—They are in the same difficulty as we are.

18580. I find from the figures you have given that the price of jute seed is Rs. 30 per maund for one variety and for another variety it is Rs. 20 per maund. Do you not think that these prices are rather high, and the cultivator must have a little difficulty in buying the seed ?—He has to get only 4 seers per acre.

18581. When you say that more money is wanted for the improvement of agriculture and it must come from within the industry, could you give us some ideas, which you probably would recommend to the Finance Member of Bengal, for raising more money from within the industry for the benefit of the industry ?—Is that for jute ?

18582. It applies to all crops, jute, paddy, sugarcane ?—The only two ways are the ones which were suggested this morning, either by an export cess or by an acreage cess, so far as I can see.

18583. Export cess or acreage cess. Let us take acreage cess. You know that Bengal is permanently settled. I do not want to refer to that because that is not within our Terms of Reference. Would you like to saddle both the cultivators and the landlords with that acreage cess ? What is your idea ?—I have not really considered the matter of an acreage cess, but I presume it would be collected, if it were imposed, with the ordinary revenue.

18584. *Professor Gangulee :* What happens to the jute tax, now ?—It goes to the Government of India.

18585. *Dr. Hyder :* You say there is a difference between the requirements of Calcutta and Dundee in the matter of jute. What is the difference ?—Dundee does rather finer work than Calcutta.

18586. About fragmentation of holdings I understand the difficulty is the existence of numerous sub-interests. You might have a plot of land in which five people might have an interest ?—Yes ; about fifty.

18587. Your problem is not the same as the problem in other Provinces, where for one plot there will be four or five sharers ?—In other Provinces it is only between Government and the man actually connected with the land.

18588. Speaking of irrigation, you say that the cultivators do not now clear up the jungles. Why is that ? They used to do it in the old days ?—There seems to be some doubt about the real reason why these irrigation tanks have fallen into disrepair. They certainly have gone into disrepair. We do not know whether it is because the landlord used to take more interest in the old days than he does now. I have been told that the old landlords exercised more arbitrary power than the British Government allows. It is difficult to explain ; but the fact remains that the tanks have gone into disrepair.

18589. In regard to cattle, if you had a good cow, could you tell me if you would slaughter that cow ?—No.

18590. Why is it then that some people say that in Bengal good cows are slaughtered ? It could not be that the people of Bengal do not possess common-sense. One of the reasons given for the scarcity of cattle in Bengal is the practice of slaughtering good cows. I asked you the question whether you would kill a good cow, if you had it ; and you said "No." I cannot believe that Bengalis would slaughter good cows ; I would credit them with the same amount of common-sense as is possessed by ordinary human beings ?—I should think so. I agree with you.

18591. About agricultural associations, I want to ask you whether the Collector really possesses a great deal of influence in the districts ?—I think his official position gives him a great deal of influence.

18592. As a Magistrate he possesses a great deal of influence ?—Yes.

18593. Now in regard to agricultural associations, you know that when these matters were under the control of the Collector he had his agent in the village and the agent was carrying out his orders. Now with regard to matters connected with Local Self-Government, these bodies, by whatever name you might call them, Agricultural Associations or Union Boards or Village Boards, seem to be hanging in the air. There is no one in the village, no functionary, to carry out the orders or instructions given by these different bodies ?—You mean the District Agricultural Associations pass resolutions and they are not carried out in the villages ?

18594. *Professor Gangulee :* Who is the moving spirit in the District Agricultural Association ?—The Collector.

18595. Even to-day ?—Yes.

18596. They have nothing to do with the District Board ?—No ; not seriously. In the 24-Parganas the District Board last year subscribed a considerable sum of money for the distribution of departmental seeds.

18597. You consider these are effective non-official organisations ?—They are if they are properly worked ; but if they are not properly worked, they are no use at all.

The Commission then adjourned till 9-30 a.m. on Wednesday, the 1st December, 1926.

Mr. R. S. Finlow and
Mr. K. McLean.

MO Y 13—5a

Wednesday, December 1st, 1926

CALCUTTA

PRESENT :

The MARQUESS OF LINLITHGOW, D.L. (*Chairman*).

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S.
Sir THOMAS MIDDLETON, K.B.E., C.B.
Rai Bahadur Sir GANGA RAM, Kt., C.I.E., M.V.O.
Sir JAMES MACKENNA, Kt., C.I.E., I.C.S.
Mr. H. CALVERT, C.I.E., I.C.S.
Raja Sri KRISHNA CHANDRA GAJAPATI NARAYANA DEO of Parlakimedi.
Professor N. GANGULEE.
Dr. L. K. HYDER.
Mr. B. S. KAMAT.

Mr. J. N. GUPTA, I.C.S.
Rai A. C. BANNERJI Bahadur. } (*Co-opted Members*).

Mr. J. A. MADAN, I.C.S.
Mr. F. W. H. SMITH. } (*Joint Secretaries*).

Mr. R. S. FINLOW and Mr. K. McLEAN

Further Oral Evidence

18598. *Mr. Gupta :* As Director of Agriculture, what would you consider to be the chief obstacles in the past to more rapid progress in the administration of your department ?—At the present moment, I think it is really a matter of men ; the immediate cause is lack of men whom we can trust to develop our programme.

18599. In order to employ these men you want money ?—We want money.

18600. Do you think you have enough money ?—Last year we did not spend the whole of our budget ; there was a certain sum returned to the treasury. That was largely because, although we had a programme, we were unable to spend all our money intelligently owing to lack of men, and we decided that it was better not to throw the money away, but at the same time, we pressed for more staff.

18601. For demonstration and for research, besides these farms at the headquarters of the districts (and I understand you have not yet got farms at all the headquarters of all the districts) you have not got anything in the way of sub-divisional farms or village farms ?—There are seven districts in which there is no farm, out of which Midnapore is one.

18602. It is very desirable to have farms for demonstration work ?—Certainly.

18603. But even if you demonstrated to the agriculturists these better methods of cultivation, do you not think it is very necessary to help them financially, to enable them to put these methods into practice, having regard to the condition of the average ryot ? Do you not think they would probably want advances for purposes of manure ?—On the question of pure seed, I do not think he will require financial assistance, but he would require aid at every further step, *i.e.*, for manure, implements, etc.

18604. The District Boards are of very great assistance to you ; in the 24-Parganas, we were able to give you money for purposes of seed last year ?—Yes.

18605. In some places we have been able to help you to set up seed stores ?—Yes, that is a great help.

18606. In the District Boards of the Burdwan Division, we appointed additional agricultural officers ?—Yes, they still exist in Midnapore.

18607. And I believe also in Hooghly ?—Yes.

18608. That point, therefore, about the legal possibility of District Boards helping agriculture is important ?—I did not know it had occurred.

18609. It had arisen in connection with the possibility of District Boards helping irrigational schemes. It was pointed out by some legal authority that for sanitary irrigation schemes the District Boards could give money, but for agricultural schemes they could not. It would be unfortunate if this opinion prevailed ?—Yes.

18610. There is not much difference between an agricultural scheme and sanitary irrigation scheme, because an agricultural scheme helps sanitation ?—It all comes under rural improvement, which is exactly the object we are aiming at.

18611. I hope your department will take up the matter about the possibility of District Boards helping agriculture ?—I will certainly take it up.

18612. As you know, the District Boards get all their income from agriculture, from the ryots, and therefore it would be very anomalous if the District Boards could not help agriculture ?—Yes.

18613. On the question of research, I was not quite clear about what you want the provincial departments and the central department to do in this matter. You accepted the position, in answer to the Chairman, that this question of the delegation of agriculture to the Provinces is a permanent arrangement ?—Yes.

18614. And you do not want to depart from that ?—No.

18615. Of course you would not take away from the provincial department research in such matters as jute or paddy ?—I do not think any scheme as far as I realise it, contemplates taking anything away from the local Government; the whole object is to help the local Government to deal with urgent problems which they may not have sufficient money to tackle all at once; then you have co-ordination of the work. Yesterday, time after time, that was brought up.

18616. From that point of view, would you agree or recommend a system by which there will be annual meetings of all the heads of the Agricultural Department in the different Provinces ?—That would be involved in the scheme.

18617. You will recommend it ?—Yes.

18618. Perhaps you would also recommend that either you or your subordinate should be free to go and visit any special work that might be going on in any Provinces ?—Yes, that also would be involved in the scheme.

18619. If these things were allowed, you would not require any other form of co-ordination ? You do not want to prevent a Province from carrying out a piece of work in which it is interested ?—In any subject in which the Province feels itself competent to carry out all the necessary work, it would not be necessary for any help from an outside source.

18620. Turning to agricultural education, of course you realise and you agree that mass education in any form of literacy is most important ?—Exactly.

18621. And we discussed yesterday the methods by which we may be able to find the funds for such education ?—Yes.

18622. An acreage cess on land was suggested; you would not like to add to the burden of the agriculturists themselves ? Would it not be better to have a scheme in which the landlords, who get most of the money, had to pay a good share of it ?—Most decidedly; there has been some proposal of the kind.

18623. Such commercial crops as jute are already taxed, but the tax is diverted to urban purposes; do you not think that a greater part of that ought to go to agricultural improvement ?—Yes; it would be very wrong if it does not.

18624. And the State also ought to contribute towards agriculture larger amounts than it does ?—I think it would always pay the State to contribute as much to agricultural research and propaganda as its experts advise. Whatever the sum, I believe that sound scientific work, and the intelligent application of the results of that work, will always pay, and if that is the policy of the State, I am sure the State will never go wrong.

18625. Perhaps you are aware that there are suggestions to have an education cess, and we want an agricultural cess for agricultural purposes. You probably know that there is a scheme for sanitary work. But all this work is more or less interconnected, because after all it is an organic whole. If you want to reconstruct the rural areas, you must look to the health of the people; without health no activity is possible. Instead of having these various cesses, would you not like to have one cess for rural reconstruction ?—I have not thought about it, and I do not know if my remarks would be of very much value. It seems to me that one cess for rural improvement and rural reconstruction would be the best thing. However, I do not know whether there would be any difficulty in apportioning the cess for different objects.

18626. It would be an amount for all the three objects; you will have to take part of it for agriculture, part for education, and part for health and sanitation. They have already to pay the road cess, and in areas where village self-government has been introduced they have also to pay another cess. In addition to that, do you think there is room in

Bengal for a third cess ?—It seems to me, on the face of it, that a single cess for rural reconstruction would be better than three separate cesses and that a single cess would be liable to create less discontent.

18627. *Dr. Hyder :* Is the idea to add these on to the existing road cess ?—That would have to be done ; road improvement comes under reconstruction.

18628. For local purposes there is a cess already, and you want to add all these items on ?—I am really not competent to express an opinion.

18629. *Mr. Gupta :* If a cess of half an anna or an anna was imposed, and that anna was divided among these three objects, would it not be a good thing ?—That would furnish a large amount of money.

18630. It is better to proceed slowly in these matters ?—Yes ;

18631. That is about mass education, but as we are talking about education for the agriculturists, I suppose you are aware that only about 20 per cent of the boys of school-going age in rural areas attend school nowadays ?—Yes.

18632. That is about the figure, is it not ?—Yes.

18633. And out of these, I think I am right in saying, 4 or 5 per cent go back to their ancestral occupation, agriculture?—I do not think I can give you any exact figures for that.

18634. It is a very small percentage. If you were to devote all your attention to the children of the agriculturists, you will neglect improving the intelligence of those people who are actually engaged in agricultural industry, because, first of all, you are devoting your attention to their children. Even as far as the next generation is concerned you can only teach about five people who are doing agriculture in the rural areas. My point is this that you have got to do something to improve the intelligence of the agriculturists. Do you not think that if you had village farms where you could actually demonstrate better methods to the agriculturists, that would be a much more effective method of improving the intelligence of the agriculturists ?—Your idea is to demonstrate to them on the spot.

18635. In convenient areas as far as possible. Do you not think that that would be a sound scheme ?—I do. I suggest that the school areas which we have proposed in our adaptation of the Punjab scheme would become very convenient units for a beginning. Their number could be increased later, if necessary. For the present and as a beginning these school areas might be very good centres.

18636. As the Chairman asked you yesterday, you would not insist on every school having a farm of its own. As it is, it is very difficult to have even one farm in the Union Board. That is not a practical proposition ?—No, it is not.

18637. Would you be satisfied if you could only have one farm in each Union which is an area of about six square miles ?—It would be ample to begin with.

18638. Turning to vocational education, I find that you say that generally it is known that real demand for vocational agricultural education could not be expected before the masses of the people are aware not only that there are facilities for such education but also that it is likely to do real good. Do you not think that the object of making agricultural education vocational in order to help people to earn a living is the most effective way of popularising agricultural education? Do you follow exactly what I mean ?—No.

18639. If you take a dozen boys and put them into the school and give them some training in agricultural practice or in the theory of agriculture, then they go out either as *amins* or demonstrators. That is one way of doing things. On the other hand, you actually teach them to earn a living, so that, while they are in the school, they are also being taught a profession by which they could earn a living. Would you turn them out if they are able to combine these things together, and make them start farms of their own? That point I also discussed when the question of vocational schools came up. Would you be against a scheme like that ?—Certainly not. I think it is quite a sound scheme. My feeling however, is that at present it would be difficult to multiply these schools all over the country-side. Eventually, I believe, there would be a big demand for them.

18640. *Mr. Calvert :* What age do you contemplate ?

Mr. Gupta : We had a scheme for younger boys of 10 or 12 years of age. For urban areas like Calcutta we had the Matriculation standard.

18641. *Mr. Gupta* : On principle you would not object to the scheme ?—I should not object to the establishment of one school in order to gain experience.

18642. *Mr. Calvert:* Is it a kind of agricultural college ?—It is a farm where not only agriculture is taught but there is also a workshop, an engineering class, and things of that sort.

18643. Is it an intermediate college ?—Yes. I believe that the demand for it will grow in the future as a result of the intensive application of the Punjab scheme.

18644. *Mr. Gupta:* Taking up that point of considering all rural problems as one and working from different directions. That is a point on which I would like to ask your opinion. Do you think there is sufficient co-ordination between these departments, namely the Industries, Irrigation, Education and the Co-operative Departments ? Have you got facilities for meeting periodically and discussing rural problems together ?—There is an arrangement by which the heads of all these four departments do meet each other.

18645. Do they do so in practice ?—The idea was that they should meet once every six months. I do not think we have met yet. This has been rather a special time but it is intended that they should meet. I think it is very advisable that they should meet.

18646. It would be a great advantage ?—Yes.

18647. You know that most of these departments are Transferred and some are Reserved. Irrigation, for instance, is Reserved ?—Irrigation was included in the joint scheme.

18648. You know, of course, that under the present system of Reforms, Ministries change. Ministers come in after three years and of course they take some time to get the hang of the work of their departments. Would you, therefore, be in favour of the appointment of a Development Commissioner to co-ordinate the activities of the scheme ? It was recommended by the Administration Committee and also by the Committee on Co-operative Societies in India and I believe in Burma and in other Provinces they have accepted this scheme. Would you be in favour of the appointment of a senior officer as a Development Commissioner to co-ordinate your activities ?—My impression at present is that much more co-operation can be arranged between the departments without appointing such an officer.

18649. Would not there be a danger of any executive order remaining a dead letter unless there is somebody to see that it is actually carried out ? As things are, if you want to pursue any particular policy, you will have to come and see the Secretary, who, in his turn, will consult the Minister. As I said, the Ministers change every three years. Of course from the practical point of view, I do not want to make any aspersions, he must take a little time before he understands exactly what the requirements of your department are. But if you had a senior officer of administrative experience he would be able to keep you in touch if he had also some powers as was suggested in the scheme to which I have referred. Would not that be an advantage ?—Would the Development Officer replace the Secretary ?

18650. The scheme was not worked out in any detail, but if you had such an officer would not that be a great help ?—I am not sure.

18651. Do you think it might create difficulties ?—At present you have got the Secretary and the Ministers for the four development departments.

18652. I do not think there is as much connection between all these nation-building departments as there should be. The only link now is the district officer and even he has not got any definite orders from the Government on the subject. That is a point to which I will come presently. I am for the moment referring to the suggestion of the Administration Committee and of the Committee on Co-operative Societies which distinctly suggested that for each Province there should be a Development Commissioner. This suggestion has actually been accepted in Burma, I do not know with what results. For the better co-ordination of your work and of these departments would you not favour such a scheme ?—I would like to think over the matter before I express any definite opinion. So far as I remember there was one point in the scheme and that was to do away with the heads of departments. I have forgotten the scheme.

18653. Would you like to consider that matter and give your considered opinion on the matter ?—Yes.

18654. Now, with regard to the co-ordination of your department with the officers of the general department, namely, the Collectors, the Sub-divisional Officers and also the Circle Officers. Do you think that you get a lot of help from them ?. Do the district officers take interest in these matters ?—I think we certainly get help from district officers. If the Collector takes an interest in the work in his district, it immediately makes more progress than it would otherwise do. The mere fact of the Collector's association with the work raises its prestige and that is a great asset.

18655. Do you think that an executive order of the Government directing the attention of the Collectors to this important matter and laying down that agriculture is one of those matters to which they must give special attention would be a great help ?—Certainly. I think it will do a lot of good. It would make the propaganda work in the district very brisk if the Collector were to take interest in agriculture in proportion to his ordinary duties.

18656. And he might also ask one of the Deputy Collectors with special knowledge of agriculture to take an interest in it. I do not mean to say that the Collector will do the work of the Agricultural Department but he will consider that as one of the most important duties of the district ?—Yes.

18657. I am going down even lower. Do you not think it would be a good thing if the Circle Officers were also brought into the scheme ?—Yes, it would be a good thing.

18658. Would you like to see the Union Board a sort of centre where the sanitary work, the agricultural work and the co-operative work might be done ? If you had the money, would you like to appoint the Union Board agricultural officer to look after your demonstration farms ?—That is part of our programme which was enunciated by Government in 1919.

Of course, retrenchment interfered with it, but it has not been rescinded.

18659. *Sir Henry Lawrence :* You say that the issue of such an order by Government would do some good ?—I think so.

18660. An order to what effect ?—Asking the Collectors to regard the work of agriculture in their districts as part of their ordinary normal duties.

18661. Have you not got that order already ? Is it not already a part of your regular routine ?—The Collectors are willing to help us whenever they are asked to do so. Some go a little further and take their own initiative.

18662. Have you not got a definite order to that effect issued by the Government of Bengal only last March ? It is dated 15th March 1926, paragraph 7 ?—There was an order issued in 1919 about the help of the Collectors in the districts. But this is the Resolution on the annual report. Paragraph 7 runs as follows, " The Governor in Council agrees with the Director of Agriculture that the district officials are in an especially favourable position to exercise their influence in controlling the agricultural policy of their districts in the matter of propaganda and demonstration and in organising work among non-officials and agricultural associations and co-operative societies."

18663. You want orders more definite than that ?—Probably this Resolution may not have reached every District Officer. If a copy of this was sent to each District Officer, that would be quite sufficient.

18664. *Mr. Gupta :* Drawing the special attention of the District Officers in this matter ?—Yes, but I do not want to burden the Collectors any further.

18665. *Sir Henry Lawrence :* Does not a resolution of that character go to every District Collector ?—I do not know.

Mr. Gupta : It does.

18666. *Professor Gangulee :* Do I understand correctly that copies of these resolutions are not sent to the district ?—I think they are.

18667. *Mr. Gupta :* But in any case you find as a matter of practice that some Collectors take a lot of interest, while other Collectors do not take the same amount of interest. Of course, you are not in a position to say what the executive orders of Government are, but if the special attention of District Officers were drawn to this matter, it would be an advantage, would it not ?—I think it would be an advantage, yes. I would not like to say that some Collectors do not take much interest in agriculture.

18668. They do not take so much interest as others do ?—I have always found every Collector I have approached ready to help.

18669. But do you get the same assistance from all Collectors ?—Some Collectors do take the initiative, as I say.

18670. Do you not think that circulation to all District Officers would be advisable with regard to any executive orders based on a resolution ?—I think it would be advisable, yes.

18671. With regard to statistics, several questions were put to you as to the average income from various sources, and some of the figures did not tally exactly. You do not deny that the average cultivator in Bengal is very poor ?—Yes, compared with some standards, but there is one thing that is quite certain ; that is that his income is increasing, especially in jute-growing districts.

18672. But there is room for a much greater increase, is not there ?—Yes, I mean there would not be any object in our appointment if we knew we could not increase the yield.

18673. Even in jute-growing districts, in years when there is very little demand for jute, as in the present year, for instance, it is at once reflected in their economic condition, and they go to the *mahajan* ?—I am not sure that it would be necessary to go to the *mahajan*.

18674. Of course, you would not be opposed to the collection of laborious and elaborate statistics, but, it being accepted that they are poor, do you not think the energies of your department would be better devoted to increasing the wealth derived from agriculture than in collecting elaborate statistics which will vary from year to year, and which would not be really complete unless an enormous amount of money is spent ? For instance, if statistics as to agricultural indebtedness of the ryots were to be collected, that loan would mean the expenditure of 20 lakhs if anything of value is to be produced ?—Yes.

18675. Do you not think those 20 lakhs would be better employed in helping the agriculturist to improve his conditions ?—My opinion is that we are too small a department to spread our energies very much. That is why we have had to say " We do not know ", in answer to so many questions that have been asked us by this Commission. All along we have felt that, if we did not concentrate, we should produce no appreciable result whatever. Therefore I agree absolutely with what you say as regards concentration. It is just possible that we may be able to help, but I think it would be folly to detach any considerable proportion of our men or to attach any considerable proportion of the present staff's time in obtaining statistics, if the propaganda work, which would mean increasing the wealth of the cultivator, had to suffer.

18676. For instance, Mr. Momen says they are very poor; Major Jack says they are not so poor; they are two very able officers ?—Of course they are speaking of two different districts. Mr. Momen speaks of Jessore which is what is called a " dying " district.

18677. It is very difficult to obtain statistics for the whole Province, and those statistics will not remain uptodate for more than a year or two ?—Yes, that is so.

18678. I suppose you agree that irrigation is one of the most important problems in the whole sphere of your administrative work ?—I do.

18679. As far as I could gather, up to now your department has not been able to do very much in that connection ?—Practically nothing up to the present.

18680. That is unfortunate. That is one of the directions in which, if you had money you could do much more, is it not ?—Yes.

18681. That is where your department is starved for want of money; this is very much to the point, is it not ?—Yes.

18682. I want to draw attention to the actual way in which irrigation works are being carried on in this Province. You may not have a very intimate knowledge of these matters, but I should like to have your opinion. You know that irrigation works in Bankura and Midnapore are being carried out through two agencies, by co-operative societies and under Act VI of 1920 ?—Yes.

18683. In the co-operative system we are assessing the value of the lands which are likely to be benefited, getting the parent societies to lend money and then taking up the work. Under Act VI of 1920 unfortunately only one scheme has been taken up; you probably know that is the Swahdeeka scheme. We have a very elaborate procedure laid down. It has been suggested that minor schemes which relate to one district only should be freed from the elaborate procedure laid down in this Act and made over to District Boards, the Chairmen of which might have the authority to initiate such schemes and carry them through. Would you not favour such an idea with a view to doing away with all the difficulty that exists ? At present you have to consult the Irrigation Department, the Agricultural Department and the Sanitation Department ?—Yes.

18684. All the Collectors are agreed that this is a procedure which practically prevents the initiation of any such scheme ?—Yes.

18685. It is now proposed that with regard to small schemes the District Board and the District Engineer should be able to initiate and carry through these schemes; would you be in favour of that?— I should be inclined to accept the opinion of the Collector in the matter; if he considers it is advisable, I should agree with him.

18686. Unless the Collector thinks it is necessary, you would not require him to consult the sanitary engineer, the irrigation engineers and the agricultural officers in every case; unless he requires such assistance you would not make that a sort of legal requirement, would you ? Perhaps you are not quite familiar with all the requirements of the Act ?—I was wondering whether the Collector would not very often, if not always, want to

know whether a particular scheme would likely be of the value at which it is estimated. It would not take long; if he merely had to consult the three departments concerned, it would not take more than a week or two at the outside I should think.

18687. As the irrigation officer is coming, perhaps that point had better be left until he comes; but you would be in favour of a simplification?—Anything which would simplify it and keep it safe.

18688. Since 1920, when this Act was introduced, only one scheme has been undertaken; if that is the fact, you would certainly be in favour of simplification, would not you?—All the information I have had is to the effect that Act VI is too cumbrous.

18689. In view of the fact that paddy seed in bulk cannot be transported except at great expense, you think it would be a great advantage to have seed farms?—Yes.

18690. Would you not connect these seed farms with the village and Union farms which have been suggested?—Yes, certainly; you would have a seed farm near every school where you have anything like agricultural classes.

18691. In the union you would have that?—Certainly. Probably your school farm would be a seed farm, to some extent at any rate.

18692. As the Chairman said, the problem of improving the cattle and also encouraging dairy-farming and cattle-breeding is probably the most important question connected with the industrial development of Bengal?—Yes.

18693. For instance, you have a cattle farm at Rangpur and one at Dacca?—Yes.

18694. I have not seen the Dacca one. Central Bengal and Western Bengal have not got anything?—No.

18695. We have acquired, as you know, 400 acres of land in Krishnagar, and you have seen that?—Yes.

18696. Is not that admirably suited for the purpose of a cattle farm?—With irrigation that would form a very fine farm. That scheme has been sent up to Government and is before Government now.

18697. Your department is in favour of that scheme, I hope?—Yes, we sent the scheme up.

18698. Has anything been done with regard to letting District Boards, and even Local Boards and Union Boards, have your breeding bulls free?—We are just developing that policy of sending out available bulls in the first instance to District Boards or other bodies, and to some extent also to responsible private individuals who would undertake to look after the bull and allow it to serve cows.

18699. Have you a sufficient number of bulls to go round?—We should certainly not be able to deal with a very large number at present.

18700. There again you are handicapped for funds; if you had more money you could do it?—Yes, but we have got to go a little further in investigation before we go out on a very large scale with these bulls. That is why we are so anxious to get a Cattle Expert.

18701. With regard to that matter of Western Bengal which my friend the Rai Bahadur brought up; of course you would admit that Western Bengal agriculturally is the part of the Province which requires most attention?—I think it is the poorest part of Bengal.

18702. You have seen Dr. Bentley's figures by which he shows that agriculture has gone down in parts of the Presidency extensively?—Yes.

18703. And your own experience would bear that out?—I think so, certainly.

18704. It requires your attention, and your department headquarters being at Dacca, could you not give special attention to Western Bengal? As the Rai Bahadur suggested, you would be in favour of having a rather large farm near Calcutta which is an important centre of the brains of Bengal, if there is no difficulty as to acquisition of land?—I think there are points in the scheme of having a farm near Calcutta, if it is only to demonstrate to the public what we are actually doing.

18705. At Jadabpur we are able to acquire about 600 bighas for a lakh of rupees only, which is very small?—Yes.

18706. If we elaborate a scheme like that, your Department would help in putting it through?—I have a doubt about the farm at Calcutta if it is intended to benefit agriculture in Western Bengal. In Western Bengal I have always had in mind the upper parts; I believe that it is in those tracts that there is a very large scope for improvement. I doubt whether a farm in Calcutta or near Calcutta would be of very much benefit to these particular tracts.

18707. Those districts are going to have district farms ?—Yes.

18708. You know Calcutta is really the centre of the brains of Bengal ?—Yes.

18709. People from Bankura, and everywhere else, come to Calcutta ?—Yes, I realise all that, and the advantage of having a farm of substantial size near Calcutta as a demonstration of what the department is doing. But my ambition is to enlarge a farm like the Suri farm, for instance, and eventually to try and establish a cattle farm there, because all the indications that we are getting at the present moment are to the effect that we shall be able to produce fodder crops on a considerable scale in a good many of the highlands in that particular tract; certainly from a climatic point of view I think it is more suitable for cattle-breeding than either Eastern or Northern Bengal. It is a question of funds and which is the most urgent thing; but I do regard the development of a new farm somewhere in the highlands of Western Bengal as being a matter of very great importance.

18710. But you would not be opposed to a farm near Calcutta, would you ?—No, I would not oppose it; but I think we should have to consider it in the light of this other scheme which I have.

18711. It is a question of funds again ?—Yes, it is a question of funds.

18712. If you had more money, would you probably do it ?—I have no objection in principle to a farm near Calcutta.

18713. If in this farm, we had parts of the farm, small commercial farms, in which a certain number of students are trained, for instance in elementary engineering and if at the same time you put up machinery and buildings, they will be in touch with the requirements of a big city like Calcutta and those farms could be run on co-operative principles and you will be taking a certain number of young men and opening up a very profitable vocation for them; do you not think it is an experiment worth trying ?—I think we have to consider all that. What I should like first of all would be to see the farm divided into plots and actually doing demonstration work and then I think we could gradually add on the teaching part of it practically, take the boys in and give training in practical agriculture possibly with a little engineering. It is a very big scheme.

18714. But would you like to see how it works ?—Yes, I think we should have to proceed gradually and go step by step.

18715. You know the University and the District Board have all agreed to help such a scheme ?—I know there is a very considerable public support for an idea of this kind.

18716. And your department more than any other department should be in touch with public opinion in such matters ? Do you not think so ?—Decidedly. On the other hand we also have responsibility.

18717. Undoubtedly ?—Advisory responsibility; and we should have to think about a scheme of that sort very very carefully before we give it the seal of approval, because supposing we take say a lakh of rupees of public money subscriptions and then the scheme failed, the department would be very unpopular.

18718. But have you any particular reasons for thinking that the scheme is likely to fail ?—We have got to consider all sides.

18719. You have not got any special reasons but you think as a matter of policy, as a matter of precaution, it will be necessary to carefully examine the scheme ?—Yes; that is all that I wanted to say. I have no antagonism to that scheme.

I make a present of that scheme to you.—Thank you.

18720. *Sir Ganga Ram:* You have got about 22 million acres under paddy ?—Yes.

18721. And paddy will not grow without water ?—Quite true.

18722. Do you know what quantity of water is required to mature the paddy crop ?—We estimate it at about 36 inches annually.

18723. No; 36 inches will not do. Eight waterings of 6 inches and the first watering of 9 inches, that is what we have found out to be necessary ?—You have got a different climate, the loss by evaporation is much more in the Punjab than in Bengal.

18724. Never mind. Even admitting that it is 36 inches you have only got under irrigation a million and a half acres ?—I think it is much less than that.

18725. Can you give me information as to how much rainfall is certain ?—In Bengal ?

18726. Yes ?—It varies widely. In Western Bengal on the borders of Chota Nagpur it is about 55 inches.

18727. No, no; what area can be safely counted upon as protected by rainfall?—Eastern Bengal and it would really be the silt portions of the Province. I am afraid I cannot tell you definitely.

18728. Roughly?—Say at least half; something like that.

18729. That means to say that if rains fail, then 11 million acres will be without any crop?—Not at all.

18730. You say 22 millions altogether?—I mean you never get a complete failure.

18731. That is exactly what I ask. How much is the complete failure?—None.

18732. None whatever?—None.

18733. You get sufficient rain to irrigate 22 million acres?—We do not irrigate at all excepting.....

18734. By rainfall or by artificial irrigation; that is a different matter. You want water all the same?—Of course, yes.

18735. So I say how much area out of the total do you consider rather risky?—I should say that the crop is liable to be reduced by uncertain rainfall over the districts of Midnapore, Bankura, Burdwan, parts of the Dacca district, parts of Mymensingh Malda, Rajshahi and Rangpur.

18736. How much is it?—Say, half. We have not got all the figures here; we could give you the reference.

18737. That means to say that you must secure Bengal with certain irrigation extending over half the area?—I quite agree.

18738. You mean the problem of Bengal is to bring at least 10 million acres under irrigation?—We want to have water so that we can make any crop grow.

18739. You understand what I mean? 10 million acres is the very lowest figure which ought to be brought under irrigation to call it a protected area?—We had better not put it in figures; I would rather put it down as a very large area.

18740. How much?—I cannot tell you exactly.

18741. I want to carry on that question to the Irrigation Department?—I would agree to have it as a large area, a considerable proportion of the total area of transplanted rice.

18742. I want only what you consider as the minimum area which can be called a protected area in Bengal?—I would like to say a very considerable proportion.

18743. Because I want to carry on that question to the Irrigation Department?—I would let you have that after the meeting is over; it can only be a rough estimate.

18744. What are the functions of your demonstration farms? You do not teach them the proper lines of cultivation?—I think we do, most decidedly.

18745. If you do not teach them that three crops of paddy taken away from one and the same field is ruinous to the soil what else do you teach?—We do not grow three crops.

18746. Do you take two crops of paddy?—Very often.
Then you simply waste the soil, that is all. I can guarantee twice the yield from one crop of paddy.

18747. *Sir Thomas Middleton:* Mr. Finlow, yesterday I put some questions to you on Tables I and II of your Agricultural Statistics. I want you to refer to Table IV which gives the area sown with different crops in each district—Agricultural Statistics of Bengal for the year 1924-25—page 6. Would you compare also the Season and Crop Report of Bengal for the year 1924-25, Appendix III, page 8? The first question I want to ask you is whether these two volumes are issued annually?—Yes. The Season and Crop Report for 1924-25 was published by the Director of Agriculture in May 1925. In Agricultural Statistics for 1924-25, tables 1-5 were compiled by the Director of Agriculture and submitted in proof to Government in October 1925. The remaining tables are compiled by the Director of Land Records and the whole is published by Government as soon as possible. Therefore, as a rule, the volume of Agricultural Statistics appears about six months later than the corresponding volume of the Season and Crop Report. Corresponding volumes are labled with the same year.

18748. That is what I wanted to get at. Now to come back to the Agricultural Statistics of Bengal for the year 1924-25. We have on page 6 your Table IV. On page 30 we have the corresponding Table IV of the Director of Land Records. Now, if you compare districts in these two tables, you get very wide discrepancies. You have already

indicated to me in a general way how these discrepancies arise. But it is very difficult for a stranger to Bengal, when these two documents are put into his hands, to determine what is the correct figure to use for Bengal. I get three sets of figures. What I would like you to do is, to indicate how statistics in Bengal are compiled. Do you think you can furnish us with that ?—I think I told you this morning that I discussed this matter with the Director of Land Records for a few minutes last night over the question of areas that was raised yesterday. About the district of Burdwan, which was referred to, only a portion was cadastrally settled, and the discrepancies between the figures were due to that. In the second table were included only the areas which had been actually cadastrally surveyed, and these figures were just a portion of the whole district, whereas in the first table the whole of the district was estimated.

18749. I would make a further suggestion that there might be a short introductory note to your statistical publications warning the reader of the pitfalls which exist ?—I think that is advisable, and I will undertake to have a note put in.

18750. *Mr. Calvert :* I would just like to clear up a point which arose from your replies to Mr. Gupta's questions on the value you attach to accurate detailed information on rural conditions. Might I ask, have you found Major Jack's book at all useful ?—Yes. It will be useful to have a sort of economic study of tracts in which you prospose to work.

18751. Would you go so far as to say that before setting out to alter village economy it will be useful to have a very careful study of the existing state of affairs which you propose to alter ?—I think so. All I wanted to say is that it is necessary to carry on with the question of agricultural improvement, that is increasing the income of the cultivator and doing other work at the same time. It would never be sound policy to stop the process of increasing the cultivator's income in order to make an estimate of what he is really worth at the present moment. That is all I wish to say. I agree that the more detailed information you can have about the cultivator the better.

18752. One of the points raised in other Provinces has been the small amount of loans taken under the Land Improvements Act for wells and other improvements. You find in Mr McLean's report on the Punjab consolidation work that fragmentation was a very potent cause preventing the sinking of wells, and he has pointed out that with consolidation a very large number of wells were promptly sunk. Do you not think that kind of information will be useful to you as a guide ?—Yes ; undoubtedly.

18753. Another question which has always come up before us is, why the people will not take the advice you offer them. Do you not think that a very careful study of the economic conditions would reveal the reasons why they do not ?—Very probably.

18754. Any propaganda may be a failure because apart from fragmentation of holdings, debt is very often an obstacle in the way of people adopting your advice. Do you not think a very careful enquiry would be useful in showing the means of relieving them? —I agree with all you say.

18755. Do you think that a very detailed inquiry into the rural economy of an Indian village will be very valuable in your efforts to improve the conditions ?—Yes.

18756. *Professor Gangulee :* Mr. Finlow, I desire to ask you one or two questions with regard to the line of organising research on crops. You mentioned in answer to Sir Thomas Middleton that you would like to have research on pulses ?—Pulses were mentioned as an instance.

18757. Yes. Supposing you had the facilities, what particular line of the problem would you tackle with reference to pulses ?—I do not know what you mean.

18758. What line of research on pulses do you think is most important ?—It is absolutely on the same lines as the research on cotton.

18759. Is there any particular problem awaiting solution with regard to pulses ?—I think most certainly that there is just as much possibility in pulses as there is in cotton or jute.

18760. With regard to pulses would you aim at breeding high yielding varieties or at manurial experiments ?—Everything.

18761. You have nothing definite in your mind ?—Everything is perfectly definite ; anything that you do in the improvement of any crop would apply to pulses. We have detailed them with regard to rice and jute, and all the work on pulses would be exactly the same.

18762. There are various kinds of pulses grown in Bengal ?—Each crop of pulse would receive attention. We would give attention not only to the yielding capacity of the various types, but also to the market value, the commercial side, manure, and so on.

18763. In regard to fodder crops you say that several crops, including millet from Manchuria, *rheana* from Bombay and Guinea grass have been introduced. Can you give us an idea of the acreage of millet from Manchuria, *rheana* from Bombay, and Guinea grass? —Millet was only imported 2½ or 3 years ago. It is grown in all our farms in the districts and seed is being given out to people round the farms.

18764. Could you give us an idea of the extent it has spread?—It is still in the demonstration stage.

18765. With regard to cattle, the Rangpur and other farms were started during the time of Mr. Blackwood. Do you think there has been continuity of policy in respect of cattle-breeding since then?—Speaking generally, yes.

18766. Who is in charge of cattle investigation?—At the present moment?

18767. Yes?—Mr. McLean and myself. There is a Deputy Director whose headquarters are at Rangpur, and he carries out the orders of the Assistant Director and myself. In the course of the next week or two, I hope we shall have a Cattle Expert who will devote special attention to Rangpur.

18768. Do you approve of having Government demonstration farms or do you approve of the idea of demonstration on the farmer's own lands?—It would be impossible to multiply Government demonstration farms indefinitely.

18769. You have already 19?—We have got 19, and we hope to have 30 altogether in the end. It may be that in addition to that, according to the present policy, there will be small farms attached to various schools.

18770. Those of course will be Government farms?—They will be more or less Government farms because they are subsidised by Government.

18771. I am aiming at Mr. Knapp's method practised in the Southern States of America, *i.e.*, demonstration on the farmer's own land?—Yes, we do that.

18772. Do you not think it will be more useful?—As far as staff is available we certainly do it; but wholesale demonstration on the farmer's land means a very large staff. That is why we resorted to the free distribution of small packets of jute seed and of paddy seed, a system which has produced excellent results.

18773. Do you see any change in the farming practice in the neighbourhood of your farms?—Certainly.

18774. In what direction?—Crops grown on Government farms spread into the neighbourhood.

18775. They take to them very quickly?—Yes.

18776. Do you think that the Rajshahi farm has affected the farmers in the neighbourhood?—The last time I visited Rajshahi cultivators were coming to take paddy seedlings from the farm.

18777. With regard to finance, you have been telling us that retrenchment has mutilated your department. I shall now turn to the figures of your expenditure. In 1915-16, your expenditure was 5¾ lakhs; in 1916-17, it was 10 lakhs. Then came the retrenchment, which reduced the expenditure by two lakhs. In 1924-25 it was 8¼ lakhs, and the budget for this year is Rs. 12,31,000?—No; it is under 10 lakhs now. You are including the gardens.

18778. The present figure is 9 lakhs; yes. Have you an Entomologist?—There is an Assistant Entomologist, a man in the subordinate service.

18779. Then with regard to artificial manures, are you aware of commercial firms in this Presidency trying to introduce artificial manures?—Yes.

18780. Are you in touch with them? Are you in touch with Messrs. Shaw Wallace and Co., in their propaganda compaign?—Yes. We are doing experiments in collaboration with them.

18781. The British Sulphate of Ammonia Federation proposes to spend £20,000 in propaganda?—I am told so.

18782. Are you in touch with that propaganda?—Yes.

18783. Are you aware of any complaints made by commercial firms dealing in manures in this Presidency that they are not getting sufficient help from the Department of Agriculture?—I have heard of no such complaints.

18784. Do you exercise control over agricultural education yourself, or is it controlled by the Department of Public Instruction?—You mean the school at Dacca?

18785. Yes?—It is entirely in our hands.

18786. That is entirely under your control, not under the control of the Director of Public Instruction ?—It is entirely under my control.

18787. With regard to implements, do you take any credit for the work done by Messrs. Renwicks, in the introduction of their sugarcane mills ?—None at all.

18788. On page 11 of your memorandum you say, " One great difficulty with the demonstration of implements is the belief of the cultivator that his cattle are not strong enough to draw the implement. It will take time to overcome this prejudice. " Is it really prejudice ?—Yes, it is prejudice ; in order to overcome it, at the various small cattle shows that we have, which are subsidised, we stipulate that before we can subscribe to the show or help it financially there shall be a ploughing match.

18789. Do you think this belief of the cultivator that his cattle are not strong enough to draw the implements that you recommend, is a prejudice ?—I think it is a prejudice. In some places the cattle are too small, but in many places they are not too small for a comparatively small implement. There is another side of our work, which is to improve the cattle, and produce a dual purpose animal.

18790. With regard to your administration, one of your Deputy Directors, Mr. Smith, has sent us a precis in which he states " We have too much petti-fogging work to do ". Could you say what he is referring to ?—I have no responsibility for what is written by Mr. Smith.

18791. *Mr. Kamat :* There was a committee appointed in this Presidency to examine the question of hydro-electric possibilities ?—Yes, I believe there was but I know very little about it.

18792. Do you know that they recommended that there is very little scope for such schemes in this Presidency ?—I believe they did, but I have no very positive knowledge about it.

18793. About this idea of a Development Commissioner, because the Ministers change every 3 years, are you in favour of stereotyping a policy, or having a change of policy every 3 years ?—I think new ideas are always valuable, but I do not think it would be wise to reverse a policy every three years. I think there should be a certain permanent object in view. One Minister may think that perhaps the means used might be altered a little, but I think there should be a sort of general continuity.

18794. Are you also in favour of centralising in the hands of one Development Commissioner various departments ?—I would rather not express any very definite opinion on it.

18795. On the question of the jute cess about which you spoke yesterday, is the jute cess at present levied here absolutely an Imperial asset ?—Yes, I believe it is.

18796. You do not derive a penny out of that for the improvement of Bengal agriculture?—None.

18797. You stated yesterday that jute was a paying crop, taken as a whole ?—Yes.

18798. You also admit that, compared with the other Provinces, your land revenue in this Province is very much less ?—It must be ; the expenditure per head in this Presidency is very much less than it is in Bombay.

18799. Therefore, if you want money for the improvement of agriculture, there is a large scope for enhancement of the cess on jute, and allocating it to the Bengal Presidency? —Yes, I think so.

18800. *Dr. Hyder :* Do I understand that you are in favour of a policy which would give the proceeds of export duties to particular Provinces ?—In regard to the jute cess ?

18801. Jute, I understand, is not purely a Bengal crop ; you have got it in the United Provinces, and in Bihar. So, that would be a difficult matter ?—Of course. What has been proposed, I think, in regard to Bengal is that the Government of India should be a little more generous to Bengal, on account of the fact that it derives such a large income from the jute cess in Bengal.

18802. If the Government were to impose export duties, surely other Provinces will complain ?—They should not be enriched by Bengal.

18803. There is one more point arising out of the replies which you gave to Mr. Gupta. Do I understand you to say that you would be in favour of the location of an agricultural farm, for the improvement of agriculture in Western Bengal, at Calcutta ? Surely such a farm should be located in the highland tracts like Bankura or Birbhum which represent the bulk of the area. ?—My wish is that we should improve the agriculture of Western Bengal by enlarging the farms at Bankura or Suri.

18804. *The Chairman :* On this matter of the possibility of a Provincial Development Commission or a central body designed to bring departments together and to keep them in touch, co-ordination need not mean rigidity in the matter of policy, need it ?—No, I should think not.

18805. You know the story of the very large family who occupied one bed and when father said, "Turn," they all turned. It did not mean there was any lack of adaptability; they all turned together. If really there is a change of policy, it might be just as well that all the departments of Government were informed in such a manner as to make the new policy workable ?—Yes.

Rather than lack of direction in the matter of co-ordination and lack of interaction.

18806. I do not know whether you wish to say anything, before you leave the witness's chair, about cattle disease and the desirability of, either by legislation, or by administrative steps not requiring any further legislation, making some attempt to prevent the invasion of uninfected areas by epidemic diseases ?—I do not think I can express any definite opinion as regards the details of the subject, because the Veterinary Adviser to Government will give evidence before this Commission. I would like to say that there is an appalling amount of cattle disease in Bengal, and any measures which can be taken which would tend to diminish the disease are very highly desirable.

18807. And cattle disease in a country of small owners, where cattle represents so large a part of the cultivator's capital and of his tractive power, would inflict, I take it, great distress ?—Yes. The loss of bullocks through disease means the loss of an appreciable proportion of his capital, and it is the loss of bullocks which is one of the important causes of a cultivator getting into debt.

18808. The death of his working bullocks means a calamity of the first order ?—Yes.

18809. You are probably familiar with the broad arrangements in America as between the Central Department of Agriculture and the States ?—I have no detailed knowledge of it, but I understand there is a Federal Department of Agriculture in the United States and that each separate State of the Union has its own Agricultural Department too.

18810. And in fact the Central Department of Agriculture in America is one of the most powerful, probably the most powerful, and the most active Ministry of Agriculture anywhere in the world ?—That is true.

18811. And, so far as it is possible to judge, I think no one who has studied the question supposes that the effect of a powerful central department has been anything but stimulating to the State departments ?—I believe that will certainly be the effect.

18812. The idea of the central department being unnecessary was very much before American politics, and I believe that Hamilton gave it as his definite view that no Central Department of Agriculture would ever be required, but experience through the last century has changed opinion in the States a great deal, and now the arrangement which you told the Commission you are broadly familiar with, is coming into being ?—Yes.

18813. You have told the Commission, in answer to a question by myself that you would wish to say something *in camera* about the monopolistic position of India in the matter of jute ; but I understand that there is no reason why you should not tell the Commission what you wish to say in public, and if you do that it would be much better ?—There is very little I have to say. In regard to jute, Bengal, or rather North-East India one had better say, has enormous advantages in climate, in man-power and in the matter of the general conditions which are necessary for the production of jute. A great deal has been said about the possibility of competition in other countries which might be able to produce jute at a figure which would compare with that at which Bengal can produce the fibre. In regard to that, we know that very good jute has been grown in a number of countries of the world. But the rocks on which their efforts have split have always been either that there has been lack of retting water or, as in nearly every case, labour has been too expensive ; it has been one or the other of these causes which has caused their efforts to fail. Now, of course it is common to say that because experiments in the past have failed, Bengal is absolutely secure in its monopoly. I think there is a certain amount of reason in this attitude as regards the immediate future. But we have the case of indigo before us, and we never know what may happen. All I would say in regard to this is that we should not sit down and assume that we are absolutely safe, but that we should take up every means of developing the jute crop, as far as its agriculture is concerned—making it as efficient a plant, and the fibre as good and as economically produced, as it is possible to do. That is all.

18814. And also to watch over the conditions of marketing and so on ?—Yes.

(The witnesses withdrew.)

APPENDIX I

Note by Mr. R. S. Finlow on the average price of jute during the last 25 years

The average (overhead) prices of jute actually paid by two large baling firms in Naraingani, one from 1900 to 1925 inclusive and the other from 1907 to 1925 inclusive, are given below. I have averaged the figures in 5-year periods, *viz.*:

1900-1904 inclusive.
1905-1909 ,,
1910-1914 ,,
1915-1919 ,,
1920-1924 ,,

I have not taken account of the last two years, partly because 1925 was a year of abnormal prices and partly because the present year is not yet finished as far as the jute season is concerned. I may however remark that, up to date, the estimated average price of jute received by the cultivator for the last two seasons so far as they go is about Rs. 12-12-0 per maund.

The following are the estimated prices per maund received by the cultivator for the periods detailed above :—

	Rs.	a.
1900-1904 inclusive	4	1
1905-1909 ,, ...	5	2
1910-1914 ,, ...	6	8
1915-1919 ,, ...	6	15
1920-1924 ,, ...	8	8

APPENDIX II

Note by Mr. R. S. Finlow on profits of jute cultivation

In regard to the discussion on Question 6 and the statement in my written evidence regarding the profits from jute cultivation, I would draw attention to the fact that the paragraph in question was written with regard to indebtedness, and the effect of a year of high prices in reducing it. It is obvious from the context that it was not intended to convey the idea that the average profits on jute cultivation over a series of years amount to Rs. 200 per acre.

As regards the actual profits made in 1925, I consider the statement made in the written evidence, with the accompanying qualifications, to be substantially correct; and that net profits of Rs. 200 per acre were not uncommon, especially in Eastern Bengal. I have already submitted a note—*vide* Appendix I—showing that the average prices of jute have doubled in the last 25 years.

As regards average profits. These are increasing with the price of jute because the cultivator still does the bulk of the work himself. Taking an average price of about Rs. 10 per maund for the last 7 years, and an average crop of 15 maunds per acre, also an average cost of production at about Rs. 5-8-0 per maund, the net return comes to Rs. 67-8-0 per acre. Most jute land bears either transplanted paddy or a *rabi* crop in the same year; so the net return is enhanced by, say, Rs. 25 per acre in addition to the above.

Rai A. N. DAS Bahadur, Officiating Chief Engineer and Secretary to the Government of Bengal, Irrigation Department

Replies to the Questionnaire

QUESTION 8. (*a*) (*i*) New irrigation schemes for irrigation by perennial and non-perennial canals are desirable in all districts of Bengal west of Long. 88°, *i.e.*, districts Midnapore, Bankura, west of Burdwan, Birbhum, Malda and Dinajpur.

The staff in the Irrigation Department is now very short and it has not been possible to make investigations to any extent towards the preparation of projects.

(*ii*) For irrigation by tanks or ponds there is no great probability now.

(*iii*) For irrigation by wells, there is a small scope but this has not yet been adopted systematically to any extent.

(*b*) Yes. The question of any large wastage by evaporation and absorption in the soil is not acute in the present irrigation works, as the area commanded lies in the flat delta region, where ordinary rainfall keeps up the subsoil water level, and the humidity prevents rapid evaporation.

The present method of distributing canal water (Midnapore Canals) at the tail end to cultivators is by direct discharge from distributaries through masonry outlets, or through village channels supplied through such outlets.

QUESTION 9. (*a*) (*i*) Improvement of soil by flooding and flushing is possible in many low-lying areas in Bengal and it is worthwhile investigating schemes which will permit of this being done as soon as the requisite staff is available. In the Province of Bengal a contour map has not yet been made available.

QUESTION 19. (*c*) Deforestation should not be undertaken in the Terais as also in the plateaus near the source of the hill streams. They should be maintained as river flood retarding agencies, as also for a better supply in the rivers during the dry season.

Deforestation should not be undertaken along the areas on the sea face in Bengal. A belt of at least ten miles should be maintained to prevent the occasional but very destructive sea waves approaching inland with fury.

For protection against damage from floods, I would advocate afforestation of areas at sources of rivers and also the flood and flush (*bonificazione*) process in the areas where the conditions are now such that left to itself the river will spill over its banks even in moderate floods. This system may now be adopted in a very large area in the Midnapore as also some areas in the Burdwan and Hooghly districts.

R. B. A. N. Das.

Oral Evidence

18815. *The Chairman :* Rai Bahadur Das, you are Chief Engineer and Secretary to the Government of Bengal in the Irrigation Department ?—Yes.

18816. You have provided the Commission with a reply to those questions in our Questionnaire which touch the work of your department and may I assume that you are also familiar with the note on well irrigation which has been in the hands of the Commission for some months ? Have you seen that ? It is a memorandum* prepared by the Director of Agriculture, I understand ?—No, I have not seen that.

18817. Do you wish at this stage to make any statement of a general character or shall I proceed to ask you one or two questions ?—I have got no statement to make.

18818. I should like to ask you whether you think there is sufficient touch between your department and the Department of Agriculture ?—Yes.

18819. Would you agree that no irrigation problem is without its agricultural problem, and that it is most important that the two departments should be in sympathetic and active touch and should interchange opinions ?—That should be the case. I think they are already in touch.

18820. Are you also in touch with the Forest Department ?—No.

18821. The Forest Department, in so far as that is the department in whose hands would lie the duty of re-foresting areas, may play a very important part in matters touching your department ?—Yes.

18822. And yet you are not in touch with them ?—Occasionally references are made, when necessary.

18823. I rather gather that the problems of denudation, erosion and of the sweeping down of large masses of soil, very often to the detriment of land lower down, are a very real difficulty in this Presidency ?—Yes.

18824. Is it your view that there might be some advantage if there was closer touch between the Forest Department and the Irrigation Department in these matters ?—Yes.

18825. Do you think that would be desirable ?—Yes.

18826. So far the Commission has been presented with irrigation problems very different from that which you have, if I understand you aright, to deal with in this Presidency. Here there is no question of the storage of water on a large scale, is there ?—Not in the bulk of the areas of the Province.

18827. Do you classify your schemes at all ? You talk about productive and unproductive schemes and major and minor schemes. What is your classification ?—This productive and unproductive classification is laid down by the Government of India. When the schemes pay a certain amount of interest after the tenth year of initiation, they are classed as productive.

18828. What is the percentage ? Is it 6 per cent. after the tenth year ?—The percentage is varied from time to time according to the rates of the loan. At the present moment it is 6 per cent. I think.

18829. So that any scheme which pays interest after the tenth year at the rate of 6 per cent. or over is a productive scheme ?—Yes.

18830. And all other schemes are unproductive ?—Yes.

18831. Have you any productive schemes in this Presidency ?—There is none existing. As a matter of fact one scheme has been sanctioned on which work has been started this year.

18832. What is the title of that scheme ?—It is called the Damodar Canal Project. It has only just been started this year. The railway siding to the proposed headworks is being constructed and arrangements have been made for staff quarters. The scheme started only very recently.

18833. What is the essential feature of the scheme that you have mentioned ? Is it an Anicut scheme ?—Yes, across the river Damodar. The cost is estimated at about 78 lakhs and the irrigable area is about 125,000 acres *kharif*. I can furnish you with exact figures if you wish later on.

18834. Is that the only productive scheme that you have in mind ?—Yes, that is the only productive scheme.

18835. All other schemes will be, technically speaking, unproductive ?—Yes.

* Not reprinted.

18836. It does not mean that they would not be of great advantage to the people of the Presidency ?—They are an advantage in a way.

18837. I do not wish to take you into the technical or engineering details of irrigation in this Presidency because I am not competent to do so nor do I think that that particular aspect is within the purview of this Commission. But perhaps you would wish to tell us whether you have any projects in mind which are likely to materialise in the near future ?—We have a few minor schemes. There is one on which we are going to address the Government of India immediately. It is a small river scheme; the river is a very small one. The cost would be about 5 lakhs of rupees. It is situated in the Birbhum district.

18838. You have no unproductive schemes on which work is actually being carried on ?—We have got now two unproductive irrigation schemes.

18839. But they are completed ?—Yes.

18840. So you are not actually at work on any unproductive scheme ?—No.

18841. Then you have these other schemes, one of which you think is likely to be taken up. Are you aiming at any broad general policy ? Are you concerned to irrigate an important area of the Presidency which is not at present irrigated ?—Not at present. I am afraid the staff that we have at present in Bengal is not enough to investigate schemes. We have only two circles of superintendence and about six executive divisions, out of which one is more or less concerned with the work of the dredging plant. So we have five executive divisions which are engaged with the urgent needs of the Province, mostly concerned with drainage. That is a very serious problem in Bengal.

18842. Am I right in thinking that these deltaic irrigation schemes require a great deal of preparatory survey and consideration before they can be co-ordinated and linked up into one whole ?—I do not think they require more than the usual schemes.

18843. I gather from these memoranda that the tendency of the deltaic rivers at this stage of their journey to the sea is to attempt to change their courses and for that reason the problem is both complicated and liable to develop in unexpected directions from time to time. Is that not the case ?—In that way it is, but it is not more difficult than in places like the Indus valley.

18844. The technical difficulties are known and are not greater than in the ordinary perennial canal irrigation ?—That is so.

18845. Does it appear to you that the fact that the problem here is in some degree a changing one suggests the need for some Standing Commissions or Committees, each concerned with one district of the country to which irrigation and hydrostatic problems in general apply ?—I do not suppose they will be able to do anything unless they are in possession of the data, and the initial thing that is wanted most is the collection of the data. As I have said somewhere, we in Bengal do not possess a contour survey of the Province. We are not in a position to initiate schemes unless we take surveys of those particular areas. I understand in other Provinces contour surveys already exist.

18846. You have not got contour surveys of the areas that might be irrigated ?—No.

18847. Would you suggest an extension of your own department to carry on that work or should it be done by some other department ?—I would suggest the expansion of the Irrigation Department. I think that is the only way in which the information can be collected.

18848. It is quite impossible, I take it, to formulate any general scheme of irrigation until these essential data are available ?—Quite so.

18849. Is the question of clearing waterways from silt and seeds and so on in the hands of your department ?—Yes.

18850. Does that make a heavy call on your staff ?—Yes.

18851. You spend a good deal of money and time on clearing water-hyacinth from navigable channels ?—We have not been able to do much at present. We are trying to make a beginning, which is on a very small scale; we are going to see what a small plant can do; it is in the experimental stage at present.

18852. What I am really concerned with is to discover whether the duties of clearing up these navigable channels not only consume part of the funds at your disposal but also a portion of the time of the superior staff ?—They do. As far as the silt clearance question in navigable channels is concerned it is very important in Bengal.

18853. Do you have the superintending of that ?—Yes.

18854. How far down the river ?—We do it in the main navigable channels, what we call the declared channels. We have a Canals Act in this Presidency and certain channels which are considered important are brought under the purview of that Act by notification. Our duty at the present moment is the maintenance of those arterial means of communication which are declared under the Canals Act.

18855. Have you dredgers working under you ?—Yes, we have.

18856. What is the deepest channel that you are clearing at the moment ?—Our usual standard is 10 feet below low water.

18857. So that you are really clearing silt from tidal waters for large ships and at the same time you are supposed to be responsible for irrigating the cultivator's land ; is that the position ?—With regard to irrigation there are only very few projects already carried out ; the Midnapore and Eden Canals are the only works we have now.

18858. Can you tell the Commission what the total annual maintenance charge of your budget is ?—It varies from 10 to 15 lakhs for irrigation and navigation works.

18859. Can you break that up at all for our information ?—For irrigation proper it is about 3 lakhs.

18860. That is, 3 lakhs out of 10 or 15 lakhs ?—Irrigation is practically fixed.

18861. About 3 lakhs a year ?—Yes.

18862. That includes drainage schemes, does it ?—No, that is irrigation only.

18863. It does not include drainage schemes in cultivable areas ?—No.

18864. Where does the remaining 7 or 12 lakhs, as the case may be, go ?—That goes to maintenance of tidal rivers and channels.

18865. How much for tidal rivers ? That is more or less a constant charge, I suppose ?—No, that has varied a good deal according to the requirements, and not only the requirements but what funds we could get.

18866. Would you tell the Commission whether you think there is a great opening for the irrigation of cultivable lands in the Presidency of Bengal ?—No, I do not think so ; the incidence of rainfall here is so heavy that irrigation is looked on more as supplemental ; in the Midnapur Canals irrigation in most years is adopted for taking in the silt rather than for irrigation itself.

18867. Building up the land by carrying the silt-bearing water ?—It is for fertilising and they get a better outturn next year.

18868. It is more for its manurial value than for filling up hollows ; is that the idea ?—Yes, they get about 20 to 25 per cent. greater yield in the irrigated areas as compared with the unirrigated areas, even in a year of seasonal rainfall.

18869. You are in touch, you say, with the Agricultural Department and with the Director of Agriculture. Have you heard any of the evidence which he has given before the Royal Commission ?—I only heard the evidence of Mr. Finlow for the last three or four hours.

18870. You know that Mr. Finlow attaches great importance to the growing of fodder crops as a means of improving the cattle in the Presidency, and he has told the Commission quite definitely that he associates the growing of these fodder crops with further irrigation. Are you familiar with his ideas in that direction ?—No.

18871. Does not that suggest to your mind that the touch between the Director of Agriculture and yourself is not quite as complete as it might be ?—It may not be absolutely complete ; the present position is that whenever there is anything in one department on which another department wants technical advice, the advice is given and we collaborate together, if necessary, by meeting.

18872. Or by the familiar method of a mutual bombardment of minutes ; is that the alternative ? Which do you think is the most effective method of getting the work done, passing minutes or getting round a table and discussing the matter ?—They both have advantages as well as disadvantages, but I think a combination of both is best.

18873. No one who has been in a department and who has any knowledge of departmental work supposes that minutes and red tape can be done without ; they are essential ; but, on the other hand, there is great value to be derived from a meeting round a table ?—Yes, certainly.

18874. You have told the Commission you do not think there is great scope for the development of irrigation, and I shall leave it at that. So much for large irrigation scheme, what about minor schemes of irrigation carried on very often by the cultivators

themselves ? I refer to the digging of small tanks and bunding of small streams where that is possible. Is there a future for that in the Presidency ?—There is.

18875. And for further terracing ?—Terracing and also the harnessing of small streams and tanks.

18876. So as to make the most of the drier seasons of the year. Now, although the cultivator as a rule carries on remarkably well by traditional methods, do you not think that engineering advice is very helpful to him when he is considering the carrying out of some such scheme ?—Yes, and an attempt is being made in that direction; we are going to have a new executive division to tackle problems in two of the districts in which conditions are favourable for small schemes, the two districts of Bankura and Birbhum. We have put a special officer in those districts, and we have worked out certain preliminaries. As we find that is appreciated, a division is going to be formed from next year.

18877. What is the division going to be called ?—It will be the Bankura Division.

18878. Are both these areas served by one expert officer ?—Yes.

18879. What is the suggestion, that these projects should be financed by Government, or what ?—No, these will be taken up either by co-operative societies or under the Agricultural and Sanitary Drainage Act, VI of 1920.

18880. And in every case the cultivators themselves are to bear the first charge ?—Yes.

18881. In the matter of well-digging, what skilled advice or engineering assistance is there available for the cultivators in this Presidency ?—In the major portion of the Province we have surface wells; in that matter they do not want advice.

18882. Do those wells give an ample supply throughout the year ?—Yes.

18883. The water table being far below the surface ?—The subsoil level in the cultivation season, the *kharif* season, is within about 3 or 4 feet of the surface.

18884. Do you call the *kharif* season the cultivation season here ?—Yes.

18885. Is that the season when you most want water from wells ?—We in Bengal really irrigate from the rainfall, which is ample.

18886. Is it not in the *rabi* season that you want irrigation from your wells ?—In the *rabi* season the subsoil level goes down to about 20 feet.

18887. *Sir Henry Lawrence*: When does your *kharif* season begin ?—The *kharif* season begins from the end of June to the middle of July. The crop is harvested in December.

18888. What is the *rabi* crop season ?—The *rabi* season begins just after the *kharif* is over.

18889. *Dr. Hyder*: It begins in December ?—Yes, halfway through December.

18890. *Sir Ganga Ram*: That is not as it is shown in the glossary ?—*Kharif* is not the winter season crop.

18891. *The Chairman*: I am looking at the Annual Report of the Department of Agriculture, Bengal, for the year 1924-25, and at appendix 40, which is the glossary. It says "*kharif* season; English name, winter season". Is that a mistake ?—I believe so. *Kharif* refers to the staple paddy crop which begins in July; it is what we call in Bengal the *aman* crop. It begins in July and is harvested in December. That is the *aman* paddy.

18892. *Mr. Gupta*: The winter crop is called the *kharif* crop in agricultural language. Is it not the monsoon crop that you are referring to; that is the *rabi*, which is sown in June or July ?—*Kharif* is taken as the rainy season crop, the monsoon crop.

18893. *Rai Bahadur Bannerji*: *Rabi* crop begins in Western Bengal, at any rate, by the end of October or the beginning of November, when they sow the seed of potato, wheat, barley and tobacco ?—*Kharif* is the crop which commences from the beginning of June and is harvested either in October or in December according to the nature of the crop.

18894. *Sir Ganga Ram*: If the crop is sown in April and May, what do you call it ?

Mr. Gupta: That is *kharif*.

18895. *Sir Ganga Ram*: Then the *kharif* begins in April ?

Rai Bahadur Bannerji: Some of them do; others do not; that will depend upon the amount of moisture in the soil.

18896. *Sir Ganga Ram*: How do the Revenue papers show these things ?

Rai Bahadur Bannerji : I cannot say that; I am just saying what is the custom in my part of the country.

18897. *The Chairman :* I think it will be best to avoid both terms and speak of months of the year. In what season, in terms of months, does the water shortage where it exists, begin ? That is to say, when does the rain-water shortage begin and the need for irrigation by canal, lift or well irrigation commence ?—I suppose that has to be divided into two sections. For the monsoon irrigation we have plenty of rainfall except in a few districts.

18898. Which months please, because I cannot follow ?—June to October.

18899. From June to October, you have plenty ?—We have plenty.

18900. In all districts ?—In practically all districts.

18901. *Rai Bahadur Bannerji :* Is there shortage of water in October in Western Bengal ?—That depends on the rainfall; the rainfall may not be seasonal. The October rains certainly help; the final rains are wanted for maturing the crops and fail in some cases; but ordinarily we do expect and we do get them except in some districts such as yours.

18902. *The Chairman :* Broadly speaking, at any rate, until the middle of September you are well off for water ?—Yes.

18903. Your shortage begins towards the end of September or early in October, and how long does it go on ?—From the end of October the rains stop absolutely.

18904. And you get no more rain until when ?—Until well on to the next monsoon again in June.

18905. That is what I wanted from you. You have no intermediate period of storms here which gives you rain showers ?—That is very occasional; last year was an extraordinary year in that respect. They are rare exceptions.

18906. Nothing you can rely on ?—No.

18907. What proportion of the Presidency, speaking very generally, is short of water between the month of October and the breaking of the monsoon in the following June ?—I would put it down at about one-fourth.

18908. Of that fourth what proportion is irrigated at the moment, if you include the irrigated section at all in your estimate ?—None of that area is irrigated now. The project we are working on will take up a portion of that area. The Damodar Canal project will be in that area where they want water.

18909. Do you not think that irrigation as regards that one-fourth of the Presidency does offer very considerable advantages if it can be carried out ?—Yes; but those districts in a normal year get good crops.

18910. Under a scheme of efficient irrigation, would it not be possible to take not merely the crops that you get at present but another crop of the land ?—Yes.

18911. Is not that a considerable attraction to the cultivator ?—Yes.

18912. Are you in touch with the Co-operative Department ?—Only as far as rendering technical advice.

18913. Are they clearing silt from channels by co-operative arrangement in any districts or are you doing all that ?—Clearing silt from main channels is being done by the Irrigation Department; I am not aware what the co-operative societies are doing about small schemes. In that matter they do not take the advice of the Irrigation Department.

18914. Cuts between *jheels* and that sort of thing ?—No.

18915. Are you carrying out any irrigation research ?—Yes.

18916. Have you any views to lay before the Commission as to the advisability of fundamental problems in research being dealt with by a Central Institute for all India ?—No, I have not thought about that.

18917. Then I will not ask you about it. We are specifically debarred from considering the actual charge, but will you explain to us the methods of charging for water in this Presidency ? Take first your productive schemes; how do you charge for water ?—In productive schemes we charge for the area irrigated.

18918. On the acreage basis ?—Yes.

18919. For water taken ?—Yes ; on the acreage irrigated.

18920. But you see the difference. You may either charge for water taken according to the acreage of crop irrigated, or, as an alternative method, attach a definite charge per acre to the land commanded, to be paid whether the water is taken or not. Are you familiar with the latter arrangement in this Presidency ?—Yes ; we assess on the area leased.

18921. Have you experimented with the volumetric system of charge at all ?—No.

18922. Have you thought about it at all ?—As far as that is concerned our supply is regulated through pipe outlets which correspond to a certain discharge for each area, and that is calculated at 80 acres to the cubic foot per second.

18923. In the matter of hygiene, are you in touch with the Public Health Officers of the Presidency ?—Yes, we are, as in the case of agriculture.

18924. Mostly, I suppose, on the problem of malaria in its relation to irrigation ?—Yes. Whenever there is any scheme we send it to the Public Health Department for their opinion before we come to a final conclusion.

18925. It is held by many persons that the attempt to prevent by artificial means the natural tendency of river in the delta to change their courses has, on the whole, been disadvantageous from the cultivator's point of view. Do you agree with that contention ?—Yes, I agree with that view and we find that to our cost. We have got embankment systems and now in some cases the beds of the rivers have risen to the level of the land.

18926. So much for the theory. Is it really practical politics to consider the possibility of removing these obstructions that have been placed by the hand of man between the river and its natural tendency to wander about across the plains ?—I suppose we could do it in some places. The question of cost has not been worked out, but I believe some of the circuit embankments could be removed, particularly in the Midnapur district.

18927. How about the danger of flooding villages, railway embankments and other works of that nature which have been constructed since the rivers were dammed ?—There are small circuits which it would be best to take over at once and we must remove the existing habitations from there and go in for rapid *bonificazione* of the area. I would rather go in for rapid silting up than have these occasional spills. As I have said, in some cases the bed of the river is higher than the land level and the river is being held between the embankments.

18928. Gradually raised ?—Gradually raised. Of course, it has become impossible to hold the river within embankments and the embankments breach very frequently in high floods ; but the effect of those high floods spilling over the land is not much ; the deposit of silt is very little.

18929. Perhaps you get the higher sections of the water which do not carry as much silt as the deeper sections ; is that the point ?—No ; the bulk of the discharge is carried by the river down below.

18930. When a river is carrying silt, is there just as much silt in the upper six inches of water as there is in the lower six inches of water, is there not ?—Yes.

18931. So that it is really a question of the size of the breach ?—Yes ; but if we could remove the embankments and let the whole place be evenly flooded, the land would be reclaimed very fast, and after reclamation it could be resold at a higher value. Probably it would be a good financial proposition.

18932. Is a scheme of that sort within the limits of what you could do with your present departmental strength ?—I believe we could make a start in small areas, in the Midnapur district for instance.

18933. Have you ever placed any such projects before Government ?—No, not at present ; they have not been worked out yet.

18934. There are no schemes in your office of that sort ?—No.

18935. Have you water-logging problems in the Presidency ?—Yes.

18936. Are you carrying out any investigations or researches ?—Yes.

18937. Where ?—In most of the districts we are investigating the causes of water-logging.

18938. You mean physically or chemically or how ?—It is physical only.

18939. With a view to drainage ?—Yes.

18940. Has there been deterioration of the soil as the result of water-logging ?—Yes, many areas have been thrown out of cultivation owing to water-logging.

18941. But when you remove the water or lower the water table by drainage, do these areas recover their fertility or are they permanently damaged ?—They recover.

18942. *Professor Gangulee :* Could you give us some idea of the total area water-logged in this Presidency ?—I put it down at about one-tenth of the area. But probably half the area that is water-logged does not require drainage, for after the monsoon is over, the river levels go down and they drain out themselves.

18943. *Sir Ganga Ram :* First of all, I want to refer to the answer you gave to the Chairman, that you have no contour surveys. Have you applied to the Survey Department ?—It is a question of funds ; the Survey Department do not undertake to do this work.

18944. Have they not got them ? Have you applied to them ?—They have not got them.

18945. Are you quite sure ?—Yes.

18946. In all other Provinces they have a contour survey ?—I know that.

18947. In Bengal they have left it out ?—Yes.

18948. That is the point. Really Bengal is the Province which most wants it, but Bengal has not got it. Are you aware of the hydro-electric scheme ?—Yes.

18949. Where did they get their contours from ?—They have only the result of the running levels.

18950. What do you mean by running levels ?—They have two lines of trunk routes.

18951. They have contours only 50 apart ?—They have not got it in Bengal.

18952. I mean the hydro-electric people ; they have got a survey ?—They must have got it out only for the local areas.

18953. What do you call a water-logged area ; up to what level should the water rise before you would call an area water-logged, four feet, five feet, or what ? What is the definition ?—I put down an area as water-logged if it is filled up with water before the area can be reaped and the water level goes up so fast that the crop cannot keep pace with it.

18954. That is no answer to my question. By how many feet should the water rise before you would call it water-logged ?

18955. *The Chairman :* Within how many feet of the surface ?—Anywhere between two and ten feet.

18956. *Sir Ganga Ram :* Is your water-logging due to rainfall or due to your canals ?—It is due to rainfall, it has nothing to do with our canals.

18957. Does that water-logging cause capillary action and bring salt up ?—We have not got that trouble.

18958. Then, how does the water-logging injure you ?—They cannot put in the crops.

The Chairman : The witness has stated that there is no permanent damage ; as soon as the water level is lowered, they can cultivate.

18959. *Sir Ganga Ram :* Are you aware of the fact that in the Punjab we have considerable water-logging due to canals ? What we have to do is to pump out the water and put it in the canal. Are you aware of that ?—I have heard about it.

18960. Cannot something of that kind be done by having a canal at a higher level and pumping up the water into the canal ?—It would be expensive and financially unsound here.

18961. But you have not calculated it yet ?—We have made a calculation for one or two areas, and we have found that it is not financially sound. But there is one area in Sabang where it can be done.

18962. Supposing a man's land is a little higher than the river or canal, or whatever it is, do you pump the water up by lift irrigation ?—No.

18963. Has nobody attempted it ?—The cultivator on his own initiative has done it.

18964. Have many cultivators done it ?—Yes. A good deal of lift irrigation is done from the rivers in the Burdwan district particularly, but only by small lifts.

18965. You told the Chairman that the rains stop in October ?—Yes.

18966. There are three important crops of paddy. It is stated that the *aman* or the winter paddy is harvested from mid-November to the end of February. It is the most important crop, because 16 million acres are under it. How do you irrigate it ?—The final irrigation is over by October.

18967. You say *aman* paddy is sown in mid-June and is harvested at the end of February. Do you say that you do not give any water to that paddy ?—None.

18968. Does this *aman* crop grow without water ?—Yes, it matures. The final watering is about the middle or end of October. There is a break in the rains during the *Puja* time in September; after that they have the *niga*, when they get the soil absolutely dry; then they have the final watering in October; and there is no further watering.

18969. And that water lasts for six months ? I thought paddy was a three months crop ?—All that crop is removed by December or early January. It may be harvested from December to January; just now all the paddy crops have ripened, but they have not been cut. February is late; generally they finish by January.

18970. *Sir Henry Lawrence :* When is *aman* rice sown ?—*Aman* is sown about June or July according to the rainfall.

18971. They begin to cut it from mid-November ?—Yes.

18972. *Sir Ganga Ram :* Have you any navigable tidal channels ?—Yes.

18973. Do they pay ?—We have the Calcutta Eastern Canals. They do not pay interest. I have got the figures, and I can give them to you.

18974. I only wanted to know whether you had them. At one time, I know, Irrigation Engineers had a mania for navigation canals. They do not pay, and are now being given up everywhere. They have only ordinary canals now ?—They may not pay directly.

18975. After the advent of the railways and other means of locomotion, it is found that navigation canals do not pay ?—There may not be any direct financial result, but the ultimate result is beneficial.

18976. What do you mean by ultimate ?—I refer to the growth of trade owing to the facility of navigation.

18977. Would trade suffer if navigation were stopped ?—Yes.

18978. Do you mean that in those districts there are no railways ?—There are railways but they are expensive. The tidal canals are a very cheap method of transport.

18979. Do you suffer sometimes from floods ?—Very often.

18980. Have you read my article in *Indian Engineering*, "Floods: their Root Cause and Remedy" ?—No.

18981. Do you not read *Indian Engineering* ?—I had no occasion to read your article. I have read Mr. Gartu's papers. It may be that I was on leave at that time.

18982. You have not taken up hydro-electric schemes here ?—No.

18983. None of those recommended by the Meares Committee ?—I do not think so. Hydro-electric schemes are dealt with by the Commerce Department.

18984. Not by your department ?—No.

18985. Are you in charge of buildings and roads as well ?—No.

18986. You are in charge only of irrigation ?—Yes.

18987. You have irrigation of only one million acres ?—I am in charge of irrigation, navigation and drainage. Irrigation is a very small part of the present problem in Bengal.

18988. What is the annual maintenance budget for your department ? Twelve lakhs ?—In the neighbourhood of twelve lakhs for irrigation and navigation.

18989. What percentage does your establishment cost you for work done ?—The establishment charge is now somewhere in the neighbourhood of 20 per cent.

18990. Only 20 per cent. ?—In the neighbourhood of 20 per cent.

18991. On finished canals ?—Twenty per cent. of the expenditure on maintenance.

18992. Not expenditure on finished works ?—Expenditure on all works.

18993. Tanks are not in your charge ?—No, there are no tanks in my charge.

18994. You said that there was a scheme costing 5 lakhs which you have referred to the Government of India ?—We are going to refer it.

18995. Is it not within the powers of the Local Government to sanction works up to 50 lakhs ?—Yes, but we want to finance it from loan funds, and not from provincial revenues. That is why we are going to refer it to the Government of India.

18996. For permission to raise a loan ?—Yes.

18997. You told the Commission that silt was the same at the top as at the bottom. I thought silt would be much more at the bottom than at the top ?—That is so ; there will be more silt at the bottom.

18998. Therefore if you made regular outlets in the banks you would take the bottom water and clear it of silt ?—Yes. There is not much difference between the top and the bottom in the small rivers I am speaking of, however.

18999. Are your canals new ? Have you adopted Mr. Kennedy's system of non-silt velocity ?—We have not any new canals.

19000. Do you not remodel the canals to get that velocity ?—No, we have not done so.

19001. What is the velocity in your canals ?—1·5, 1·6, 1·7.

19002. Is it because they are navigable ?—Yes.

19003. Is that the reason why you have to keep the velocity very low ?—We can increase the velocity, but I think the re-grading would cost a great deal and it is not worth it.

19004. What I mean to say is, 1·5 is not the proper velocity ; non-silt velocity is very much more. You know Mr. Kennedy's formula. You are obliged to keep the velocity so low on account of navigation ; you cannot raise your velocity, therefore, to the proper non-silt velocity. Is that so ?—That is so.

19005. That is the reason why silt is accumulating ?—We have one proposal to have an escape in the first reach of the canal, that is in the Midnapore canal.

19006. You say you supply tail water by masonry outlets. Have you not studied the design we have finally reached in the Punjab ? With varying heads we supply the same water ?—I do not think that we could adopt it here for sometime.

19007. Do you know the design ?—Yes.

19008. Have you got a copy ?—I have seen the model.

19009. What is the objection to your adopting it ?—I cannot say ; our present design has worked fairly well.

19010. How long have you been officiating Chief Engineer in charge of Irrigation ?—Six months.

19011. Who was in charge before ?—Mr. Addams Williams.

19012. Are you permanent now ?—No ; he has gone on leave, and I am acting for him.

19013. You must have heard the previous witness, Mr. Finlow, saying that the lowest figure for land which is not cultivated on account of lack of irrigation and failure of rainfall is 10 million acres ?—Yes.

19014. Have you thought of any schemes for that ?—No.

19015. Have you studied the Irrigation Commission's Report of 1901-03 ?—Yes, I have read it.

19016. They have recommended many works for that purpose ?—They recommended certain schemes for Bengal as then constituted, and you will probably find that all those schemes fall in Bihar and Orissa.

19017. They have all gone to that side ?—Yes.

19018. None of them relates to your Province ?—None.

19019. How do you propose to irrigate these 10 million acres ? You do not feel the necessity for it ?—As I have said, the staff in the Irrigation branch is now quite busy with maintenance work, and we have not had time to collect data for fresh irrigation projects but it is very desirable that an investigation should be made.

19020. What is your system of making your irrigation charges ? How much is it per acre ?—In the Midnapore canal, for long leases, it is Rs. 3 per acre.

19021. For paddy ?—Yes, for paddy.

19022. How much is it for sugarcane ?—We have very little sugarcane.

19023. And how much is it for other crops ? You can give me the figures later on. What is your principle of giving water ? Do you give them a measured quantity of water ?

Supposing a man had 1,000 acres of land, how much water would you give ? Any amount that he would like to use ?—We leave the outlet open to an extent which would let him have the quantity corresponding to 80 acres to the cubic foot.

19024. Your duty is to 80 acres ?—Yes.

19025. Whether *rabi* or *kharif* ?—That is for the *kharif* ; for the *rabi* we have to give him any water he wants.

19026. If you have any ?—Yes.

19027. Do you collect the charges or do you ask the Revenue Department to charge a consolidated rate ?—We have a special officer collecting the irrigation cess.

19028. Who makes out the bill ?—That special officer.

19029. It is your department that makes it ?—We give him the certificate of area irrigated ; he makes out the bill and collects it.

19030. Under the heading of Land Revenue which is shown in the budget, are your irrigation profits also shown ?—I do not think so ; irrigation receipts come to irrigation proper.

19031. In your protective works are you credited with the indirect charges of the enhancement of settlement ?—We have no protective works.

19032. All your works are unproductive ?—They are unproductive, but not protective.

19033. What is the difference ?—They have been classed as unproductive because they are unproductive.

19034. Is the Revenue Department giving you any credit for the enhancement that they get due to the water ?—No.

19035. You have no such system as that of indirect charges ?—No.

19036. With regard to the ordinary surface wells, how far does the surface water go ?—About 15 to 20 feet.

19037. How do they draw it up ; by bullocks ?—They usually use the *lata*.

19038. A *lata* is a beam ?—Yes.

19039. How many acres does one well command ?—They have not done it systematically ; it is merely supplemental.

19040. For how many acres is one well sufficient ?—We have no information on the point.

19041. Can you tell me the discharge per hour, how many gallons for each well ?—I cannot say.

19042. *The Chairman :* You have nothing to do with wells at all, have you ?—No.

19043. *Sir Thomas Middleton :* You told the Chairman that your annual maintenance budget for irrigation was about 3 lakhs ?—For irrigation only.

19044. What is the annual maintenance budget for navigation ?—Between 9 and 10 lakhs.

19045. Have you under your department any canals which are navigation canals only ?—Yes, the Calcutta canals are an example. The tidal rivers of course are maintained as navigable channels.

19046. Have you any canals which are of value both for drainage and navigation purposes ?—The Calcutta canals serve for drainage purposes to a certain extent.

19047. And navigation purposes ?—Yes.

19048. In the answer which you gave to the Chairman that 3 lakhs was the amount apportioned in the budget for irrigation, did you allow any value on the benefit which you got for irrigation purposes from these navigable canals, which cost you about 9 lakhs ? You told us, I think, that under navigation you spent 9 lakhs ?—Yes.

19049. And on irrigation 3 lakhs ?—Yes.

19050. Does the figure of 9 lakhs include any sum which can be debited to irrigation ?—No.

19051. You have apportioned the figures 9 and 3 ?—That is roughly. It is perhaps the other way and a portion of the 3 lakhs ought probably to be apportioned to navigation.

19052. *Dr. Hyder :* What is your total outlay on all the canals for all purposes ?—It varies from 10 to 15 lakhs.

19053. And the total amount of public money sunk in their construction and maintenance runs into crores ?—The Midnapore canal is somewhere about 80 lakhs, the Madaripur Bhil route about 72 lakhs, the Calcutta and Eastern Canals about 85 lakhs.

19054. What is the return ?—The return is 1 per cent. odd, taking the total.

19055. *Mr. Gupta :* Would it be correct to say that the main duty of your department up to now has been to look after communications open to navigation ?—No, I do not think so.

19056. In your report about two years ago, is it not definitely stated that the keeping up of the communications is the only important work of this department ? It was probably not in your time ; if you look up your report for the year before last, you will see that it is stated there that the keeping up of communications is the main function of this department. Anyhow, from the figures that you yourself quote, namely, that 9 lakhs is spent on keeping up communications and only 3 lakhs on irrigation, it is obvious that the major portion of the money available to your department is spent on keeping up communications ?—Yes.

19057. For how long have you been spending 3 lakhs on irrigation?—For some years ; the expenditure is mostly on the Midnapore canal maintenance.

19058. Have you done any new irrigation canals since the construction of the Midnapore canal ?—The Eden canal is the only other work.

19059. When was that constructed ?—I think it was constructed in Sir Ashley Eden's time.

19060. Besides these two, no money is spent on any irrigation canals ; so that, when you say that Rs. 3 lakhs is appropriated for that purpose, it means that it is spent in keeping up these two canals ?—Yes, on maintenance.

19061. In answer to a question by the Chairman, you said that schemes were classified as productive and unproductive, and the only productive scheme was the Midnapore canal ?—No.

19062. Which is the productive one ?—We have no productive canals.

19063. My object in asking you that question is that that is only a technical term ; you will not describe these minor schemes which are going to be taken up and for which you have opened up one Division in Bankura, as unproductive schemes, except in the technical and the interest-bearing sense adopted by the Government of India ?—That is so.

19064. In a general sense, you would not call them unproductive ?—No.

19065. Did I understand you correctly to say that there was not much scope for irrigation in Bengal ? Do you mean to say that ?—Not in the major portion of Bengal.

19066. But in Western Bengal ?—In Western Bengal there is scope.

19067. In the whole of Western Bengal is it not a crying problem, in the district of Bankura for instance ?—Yes.

19068. In Central Bengal, perhaps, the question of drainage is very important ?—That is so.

19069. Referring to Act VI, to which you have referred, you know there has been considerable difficulty in working that Act ?—Yes.

19070. But you are aware that that Act was formulated to simplify the process in the previous Acts, namely, the Sanitary Drainage Act and the Bengal Embankment Act, and this Act was made purposely to simplify the process further. I suppose the idea that you have is that the delay is due to consulting the different departments. I was going to ask you if it has simplified the process. As you know, there are three departments which we consulted, namely, the Agricultural Department, your department and the Sanitary Department and the question is now before the Government to simplify it still further. Would you agree with me that minor schemes in a district, such as tanks, cutting small channels and so forth, might be made over to the Collectors and to the District Boards entirely, so that they might deal with them, making a reference to your department or to the Department of Agriculture as occasion might warrant ? Are you in favour of that scheme ?—I would certainly be in favour of that scheme, but the delay is due mostly to the procedure for allocation of cost. The time taken in obtaining the opinion of the Health Department or the Agricultural Department or the Irrigation Department is not much. The delay does not lie there ; that is my idea.

19071. Do you mean the preliminary cost of making the scheme or apportioning the cost after the scheme has been executed ?—Both the preliminary cost and the apportionment after the work is executed. The opinions of the local people interested have got to be taken and the procedure laid down appears to be simple but it is not so. It does take time.

19072. A scheme sometimes looks very feasible but after expert examination it is often turned down. If you require the people to pay the preliminary cost, it is rather hard on them to find that their money is all gone. If local bodies advance the money, do you not think it would give an impetus to get such schemes brought under the Act ? Do you not think it would be better if the Government or the District Boards or the Union Boards advanced the preliminary cost ?—That would be better, but the difficulty is that people would not like schemes to be thrust on them. The people may ultimately say that they do not want a scheme which the Collector may think should be investigated.

19073. Quite so. But they are chary of paying the cost of the preliminary survey because they do not know whether the particular scheme is going to be officially sanctioned by you or the Agricultural Department or the Sanitary Department. They are uncertain about the future of the scheme. At this stage, do you not think, if Government wanted this Act to be more largely used, it would be a great advantage if the preliminary cost were paid either by the Government or by local bodies or by both jointly ?—Your suggestion is that the preliminary cost should be borne by Government and that it should not be borne by the parties concerned ?

19074. Yes ?—There is one objection to that. What I have found in many cases is that, although there is a real need, the people do not get it because they do not clamour for it. The result of any suggestion from them would be that they probably want to spend money on investigating schemes which are not obviously necessary.

19075. Of course you might require the Collector's sanction; and a Collector will not be in a hurry to send up schemes to Government for expert examination which he did not, from a layman's point of view, consider to be sound. Otherwise, do you not think that there will be this great difficulty, that people will not come forward to pay money for those schemes because they do not know whether the schemes are going to go through or not ?—It would be a good thing to encourage them. But I would rather suggest that Government should pay a part and not the whole of the cost.

19076. In answer to the Chairman, you said that the cost was paid by the people only. You know, of course, that under section 18 of the Act, the cost is to be apportioned between the Government and the local bodies and the parties concerned. You do not mean to say that the Government is not to pay any portion of the cost at all ?—Government pay voluntary contributions.

19077. It is not voluntary, because under the provisions of sub-clause (*b*) of section 18 the Collector can apportion the cost between the parties. For instance, in the case of the Gangakhalee scheme Government is paying about 4 lakhs and the whole scheme is going to cost about 7 lakhs ?—It is a voluntary contribution and not the apportionment under the Act as the Government share of the cost.

19078. Whatever you may like to call it, the Act provides a Government contribution and the Government is actually paying. I suppose there is nobody to compel Government. But do you not like the idea that in the case of such schemes Government should pay a portion of the cost in order to encourage the people ?—Yes.

19079. The question before the Government now is how to utilise this Act, which is so beneficial in my view. The greatest encouragement that Government could give would be to pay part of the cost. Do you agree with that ?—Yes.

19080. One point about this reservoir. Is there any scheme to give up the Damodar reservoir ?—There was one proposal for retarding the floods.

19081. On which Mr. Glass was put on special duty ?—Yes. That has been found to be unworkable as it was financially unsound.

19082. From what you have said to the Chairman you do not mean to suggest that there is not much scope for irrigation schemes or that it is not the work of the Department and therefore it should not receive the strenuous attention of Government ? That is not your intention ?—What I said to the Chairman was that for the bulk of the area in Bengal, irrigation was not a crying need.

19083. It depends entirely on rainfall. Can you be absolutely certain of the rainfall in any part of Bengal ?—If it is certain anywhere, it is in Bengal.

19084. Is it not a fact that every three or four years there is either unseasonal rainfall or a shortage ?—That is so.

19085. And if we had irrigation facilities, either large schemes or small tanks or wells, we would save about 30 per cent. of the crops. For instance, for want of one shower, do not you lose about 6 annas on the crop ? Does not that happen very frequently ?—That is so.

19086. *The Raja of Parlakimedi :* You say that the department is short of staff. May I know to what extent your department has suffered in retrenchment ?—We have suffered in that we had a scheme of expansion sanctioned but we could not give effect to it. The Government of India sanctioned almost the doubling of the existing cadre, but we have not been able to give effect to it owing to lack of funds.

19087. May I know what your departmental strength was before the retrenchment was effected ?—The retrenchment has not affected us in the least. It was only to the future that I was referring.

19088. Can you give an idea of the programme of your investigations with regard to irrigation works during the past years ?—We have of recent years only had the investigations regarding the Damodar canal project which has matured. We have also got some of these minor schemes under investigation. I think we now have these investigations carried out in three districts, Midnapore, Bankura and Birbhum and about 100 other schemes are being investigated.

19089. Do you go in more for productive schemes or schemes that are more beneficial to the ryot as a whole ?—Owing to the stringent financial conditions in Bengal, I do not think any scheme for the mere improvement of the ryot would be voted funds by the Council. We have not got money to spare from provincial revenues. If we have a productive work then we can have the money advanced from loans. That is why we can now push on with productive work in preference to works of public utility.

19090. Your work is entirely confined to productive schemes ?—At the present moment, yes.

19091. Under what heads do you want to increase your staff ?—My idea is that we should have a staff to collect data so that we would be in a position to indicate schemes of drainage, irrigation and such like things satisfactorily.

19092. Has any specific proposal for departmental changes or increase in any direction been made ?—There is a proposal for increasing the staff by about 100 per cent. It has been sanctioned by the Secretary of State but it cannot be given effect to owing to lack of funds.

19093. What extra expenditure will that involve on the department ?—I cannot say off-hand but I think it would be about three lakhs per annum.

19094. What is the actual impediment in the way of having more tank irrigation schemes ?—We have not yet dealt with tank irrigation in the Irrigation branch. As the rainfall here is quite sufficient, we have not investigated any of these tank irrigation projects. It is not a crying need and, as Mr. Finlow said, the small schemes dealing with existing tanks are being proceeded with.

19095. Take, for instance, the irrigation of *rabi* crops. Would it not be better if you had tank irrigation for these crops ?—Yes.

19096. So it would be useful if you had more tanks in Bengal ?—Yes.

19097. *Sir James MacKenna :* I think you said you had some dredgers ?—Yes.

19098. How many have you ?—We have got three section dredgers of the bigger type, 42 ins. and one smaller one, 20 ins.

19099. What are they being used for ?—Two of them are laid up at the present moment. One was brought out for a proposed work, the Grand Trunk Canal, which was not eventually sanctioned ; so that that dredger is lying idle. The second dredger is also lying idle at the present moment because we have not got funds to work it.

19100. Have these dredgers functioned before this, or have they always been laid up ? Have they worked at all since they were bought ?—They have worked.

19101. What do they do with the spill material ?—They are all suction dredgers, and the spill material, the sludge, is laid on the land alongside, on the banks of the channels that are dredged.

19102. Has any scheme been considered for utilising this dredged material for the purpose of raising the level of villages or towns along the banks of creeks ?—No, not from

that point of view, but in certain areas where we have done the dredging raised lands are being sold and they will be very suitable for village sites.

19103. I ask the question because a great amount of work of that kind has been done in the delta of lower Burma. The malarious tracts have been improved by raising the level. Is your system of embankments double or single ?—Single.

19104. That means that the one side takes the whole spill ?—No, I mean double.

19105. Both sides ?—Yes ; I thought you referred to the double embankment system which we have on the Gandak river ; there on each bank we have two.

19106. I mean that each side of the river is banked ?—Here we have both banks except in certain places.

19107. The system of double embankment has a very deleterious effect on the mouth of the river ?—Yes.

19108. So that any double embanking system is very carefully watched by the Port authority as affecting the Hooghli ?—Yes.

19109. I take it the general drift of your evidence is that Bengal agriculture depends a great deal more upon a beneficent Providence than on the skill of man as represented by irrigation engineers ?—Yes.

19110. *Professor Gangulee :* In recent years you have had a number of co-operative irrigation societies in this Presidency. What are your relations with those societies ?—Merely giving technical advice with regard to schemes which are considered as important.

19111. When they draw up a scheme they ask your technical advice ?—Yes, or when they propose to do something to a certain area, even when they have not got a scheme, they ask us to draw up the scheme.

19112. And these co-operative societies pay for such advice ?—No, in practically all these cases we have remitted the establishment charges.

19113. Is your technical adviser responsible for such schemes in any way ?—No. How can he be made responsible in that respect ? I mean to say an employer employing an expert adviser can merely get what he can from him ; the technical adviser is not responsible for the scheme.

19114. Perhaps I should make my point clear. Supposing a co-operative society undertakes a scheme following your technical advice and that scheme fails, are you not responsible to the co-operative society for that failure ?—No, I do not hold that view ; Government has got some expert services and those services should be made available for what they are worth. I do not think Government can be made responsible for failure to give ideal advice.

19115. Suppose a co-operative society undertook a definite scheme, acting on your advice ; in the event of the failure of that scheme, whom would the co-operative society hold responsible ?—Anybody doing the work will have to take the risks himself.

19116. You have in this Presidency the Bengal Drainage Act of the year 1880, the Bengal Sanitary Drainage Act of 1895, and, in order to simplify those two Acts you have the Agricultural and Sanitary Improvements Act of 1920. Could you tell the Commission the total area reclaimed by drainage through the operation of these Acts ?—The only work done under the Sanitary Drainage Act is the Magra Khal drainage, which is about 500 square miles.

19117. That is all ?—That is all.

19118. So that these Acts are there but they do not function ?—No.

19119. When you have any drainage scheme, do you consult the Public Health Department ?—Yes.

19120. Do you often meet the Forest Department ?—No, the Forest Department we do not meet. The attention of the Irrigation Department with the staff which it has at its disposal has been concentrated on the more important areas near about Calcutta ; we have not really tackled problems where the forest question also comes in.

19121. You will agree with me that forests have a great deal to do with your problem ? —Yes.

19122. And therefore in this note you have given us you have something to say about afforestation ?—Yes.

19123. That is why I ask whether at any time you sit round the table and discuss these matters with the forest officers of the Presidency ?—I cannot say; it is quite possible that they may have met.

19124. *Rai Bahadur Bannerjee:* You said in reply to a question put by the Chairman that the people wanted irrigation for silt more than for water for the crops. When you gave that reply, what part of the Presidency had you in mind ?—Midnapore canal. In fact, that is practically the only irrigation work I have, so that I had that in view.

19125. But supposing in the month of October when they have no rainfall and for want of a single shower perhaps they will lose one-quarter of the outturn of their crop, Midnapore being one of the high level districts of Bengal, will not the people of Midnapore care to take the water from the canal for the benefit of the crop, rather for the sake of water than of silt ?—Not only do they care to, but they are supplied. That is why they pay; but what I am referring to is the fact that they value silt most.

19126. You have an Irrigation Act by which you can take up irrigation schemes which have to be provided for from your loan fund. Is that always essential; may it not be provided for from the provincial fund if available ?—It can be met from provincial funds. The Irrigation Act does not touch the question of finance at all; it is an Act to legalise the use of canal water and gives the canal officers power to levy water rates and so on.

19127. Cannot the Government of Bengal, if they care, supply more funds from the provincial revenues than they have been doing up till now for the benefit of the irrigation of Bengal or parts of Bengal ?—I cannot say; it is really a question of finance.

19128. You must have travelled a good deal through the districts of Burdwan and the Presidency Division, and in the course of your tour you must have come across the innumerable tanks and ponds in the fields where they grow paddy, most of which have silted up. You are certainly aware of the fact that during the last six or seven years co-operative irrigation societies have been formed which have been raising capital from the neighbouring central bank or rural co-operative bank, and the excavation of these tanks is going on. Is not that a very fruitful source of irrigation for these paddy fields ?—That is a fruitful source of irrigation no doubt, but I think the abandonment of these tanks is due largely to the improved method of transportation. Formerly each unit in a district used to live on their own product; they had to depend on their own product; but now an area which ordinarily gets good rainfall can save on three years good crops; they can keep the product of the fourth year for sale; since they can get whatever they want in a famine year in that area by quick transport, they do not store any grain, and they do not take the trouble to grow their own crops by any little protective works like these tanks.

19129. Well, whether there is sufficient means of transport for the alternative crop or not, is it not a fact that if these tanks and ponds were re-excavated they would supply to a very great extent water for the irrigation of these paddy fields ?—Yes.

19130. As matters stand now in the Province, there is no system of irrigation by tube wells ?—No.

19131. But cannot that be conveniently introduced into the country ?—Yes; research work in that direction should be done, I think.

19132. *Sir Henry Lawrence:* Did you say you were in favour of the re-excavation of tanks ?—Yes.

19133. Is that a better system than raising the embankments ?—The loss by seepage would be more if the embankment were raised than if the silt were cleared leaving only a puddle line. I think the raising of the embankment leads to great loss of water by percolation.

19134. *Sir Ganga Ram:* Would you excavate by manual labour ?—Yes; the silt is cleared by manual labour.

(The witness withdrew.)

Mr. P. J. KERR, M.R.C.V.S., I.V.S., Veterinary Adviser to the Government of Bengal

Replies to the Questionnaire

QUESTION 1.—RESEARCH.—(*ii*) *Veterinary Research.*—

Expand the Imperial Institute of Veterinary Research, Muktesar.

Reorganise its administration.

Establish provincial research laboratories in each Province, and appoint a specialist officer trained in this work in each.

Co-ordinate the work of all these under a Senior Veterinary Officer with the Government of India.

This officer would also be the administrative officer in charge of the Institute.

Finance.—The opening of a Veterinary Research Fund to assist Government of India and Provincial Governments in finding the money necessary for this work.

(*b*) In Bengal we have a small well equipped laboratory in the Bengal Veterinary College, but no specialist officer with European training in this work to take charge of it. There is difficulty in finding money for extension of this work.

(*c*) Tuberculosis, bilharziosis in cattle, parasitic diseases of all animals, including hookworm in dogs. Rabies in dogs, *bersati* in horses. Rinderpest in cattle, and its treatment and cure. The above are few of the diseases which call for thorough investigation in Bengal.

For the advancement of work of control of contagious disease of animals in India I advocate the formation of a "Central Veterinary Bureau" under the Government of India with the Veterinary Adviser to the Government of India in charge.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(*a*) and (*b*) The Co-operative Milk Union in Calcutta has been successful in inducing cattle owners to take a keen interest in their cattle, and so be willing to accept advice as to their improvement by better keeping, feeding, and breeding. The formation of such milk societies in all places where there is a ready market for milk or its products would be a great incentive to improved methods of animal husbandry. This was not the main object for the commencement of this Union, which was originally started in the attempt to solve the problem of a pure milk-supply for Calcutta. On this account latterly, it has received very considerable financial aid from the Corporation. My official interest in it is from the point of view of the improvement of cattle which results. The members of these milk societies have been willing to accept advice on the feeding of their cattle, the purchase of better cows and bulls, and lately have evinced a desire to have their cattle "permanently immunised" against rinderpest, at a cost of Re. 1-8 to Rs. 2 per head. The societies' show at Baraset has increased in a few years, from a gathering of a few heads of cattle to quite a large show, two hundred or more attended last year, and the condition and class of the cattle have greatly improved.

I would exploit milk production in Bengal to its utmost, and where it is not possible to sell milk as such, I would like to investigate the possibility of factories for milk products.

QUESTION 4.—ADMINISTRATION—(*a*) *Veterinary Administration.*—

1. Government of India can assist in this work by :—

(1) The appointment of a superior veterinary officer with the Government of India as "Veterinary Adviser."

(2) By the creation of a Central Veterinary Bureau, to advise the Government of India and local Governments on the control of contagious disease.

(3) With such central arrangement much valuable advice could be given to Provincial Governments, and veterinary advisers on all veterinary matters, education, administration and research. In the last, in particular, the work of the local research laboratories could be directed, co-ordinated, and amplified.

(*c*) I am not satisfied with the services at present rendered by the Veterinary Department in Bengal in regard to the cattle improvement side of agriculture. I have dealt with this in Question 15-Veterinary.

In my opinion the control of contagious disease must be under the absolute charge of the Provincial Government, and not under multiple control as at present in Bengal. Under this system Government have only advisory powers over the District Board Veterinary Assistant Surgeons.

All Provinces should voluntarily agree to work under the advisory control of the Government of India, so that this subject may be treated uniformly throughout India.

QUESTION 15.—VETERINARY.—(*a*) The Civil Veterinary Department should be independent of the Agricultural Department, under its own departmental head, "The

Veterinary Adviser to the Government of India." This officer should also be the Director of the Imperial Institute of Veterinary Research, Muktesar.

(*b*) (*i*) In Bengal the dispensaries and itinerant Veterinary Assistant Surgeons are under the control of District Boards. This system does not work well.

(*b*) (*ii*) The need for expansion is not being adequately met.

(*b*) (*iii*) I have already submitted a proposal to the Government of Bengal advocating the transfer of control of veterinary work to the Provincial Government. In brief my proposal is that the local Government should take over control of the whole of the "contagious disease staff" and all district headquarter dispensaries, other dispensaries to remain under the control of and in charge of the local authority.

I hope eventually to meet the need for clinical dispensaries by working through the Union Boards in co-operation, and get them to maintain a Veterinary Assistant Surgeon and dispensary at each *thana*. The cost of such a scheme is beyond the means of any Government, or District Board, it must be financed by the people themselves.

(*c*) (*i*) Cultivators do not make full use of existing dispensaries. The use made of them is yearly increasing, and is strongly influenced by the ability and energy of the Veterinary Assistant Surgeon in charge. It is handicapped by :—

(1) The Veterinary Assistant Surgeon being absent on tour for a number of days a month. And so being absent when people have come, may be a long distance, to consult him.

(2) Insufficient accommodation for "out," and usually none for "in-patients."

(3) Where there is in-patient accommodation, lack of an attendant to look after the animals. The owner is too poor to afford an attendant, nor can he supply food for the animal while in hospital. His home is often many miles off.

(4) Scarcity of dispensaries, animals have to be brought long distances entailing a loss of a day's labour in addition to the fatigue.

(5) Out-patients are not brought sufficiently often to get full benefit from treatment, for the above reasons.

(*c*) (*ii*) We have no touring dispensaries. Itinerant Veterinary Assistant Surgeons treat cases on their way, carrying a box of medicines with them and advising the use of drugs available in the bazar. The benefit again varies according to the energy and resource of the Veterinary Assistant Surgeon. Many cases are treated thus, and some benefit results, but the cases are only seen once, and most owners are too apathetic to take the trouble to get and use the medicines prescribed; at times, also too poor to buy them.

At present treatment must involve the minimum of trouble to the owner.

Suggestions to remedy this state of affairs.

1. Stationary Veterinary Assistant Surgeon in charge of each dispensary.
2. Enlargement of dispensaries, providing accommodation for "in" and "out-patients."
3. Provision of a free attendant.
4. Feeding free, or at cost price, perhaps by means of co-operative finance.
5. Establishment of more dispensaries (one in each *thana*), again by co-operative finance.
6. Adequate supervision to keep the average Veterinary Assistant Surgeon up to his work.

(*b*) *Obstacles in dealing with contagious diseases.*

1. Delay in reporting.
2. Delay in Veterinary Assistant Surgeon visiting to diagnose disease. This is largely due to the shortage of staff. One Veterinary Assistant Surgeon has such a large area under his charge, and in many districts means of transport are slow and primitive.
3. Delay in arrival of serum after it has been wired for, due in some cases to the order having to pass through the District Board office, and to the usual delays on an Indian railway, and difficulty of transport from the nearest railway station.
4. Delay, in that owners have to be persuaded to have their animals done. Also to be persuaded to help in carrying out the work. Inoculation usually means the loss of a whole day's work to the whole of the village.
5. Shortage in the amount of serum allowed by the District Board.

Legislation presents manifold difficulties, and would need to be discussed by a committee of District and Veterinary Officers with experience of conditions all over the Province and knowledge of methods employed in other Provinces (Veterinary Adviser to the

Government of India). There are no means of carrying out effectively legislation *re* notification, segregation, disposal of carcasses, inoculation of contacts, and prohibition of movement.

An enormous increase of Police would be needed, and this enforcement would bring the inoculation of cattle into disrepute, and raise opposition.

Compulsory inoculation would tend to stop voluntary notification.

Proposals

Notification to distribute O.H.M.S. postcards to approved persons, such as :— Sub-Divisional Officers, District Board Officers and members, Local Board Chairmen, Union Board Chairmen, Police Officers, Presidents of panchayats, and punish *Chowkidars* who fail to report disease in their area to the above. Some means of penalising the above officers should be devised if they delay or fail to send on the report.

Segregation is almost impossible in the district on account of the trouble and cost, and the consequent unwillingness of owners to co-operate on this account. There is added the loss of time and work of the animals (incontacts) so segregated until they are inoculated.

Movement of animals by rail and main road might be controlled if there are police available. But even so, the animals would go by side roads, or country boat, to avoid this.

Methods other than legislation to improve conditions.

(*a*) To have a consultation of all classes of Government officers to devise means to improve reporting. To give effect to their recommendations, and take steps to see that all concerned carry out the intention of Government in this respect. The measures adopted for veterinary diseases can also be applied to human diseases.

(*b*) To have a sound scheme for dealing with disease when reported, *i.e.*, adequate money, staff, and emergency staff, arrangements for prompt supply of serum to the seat of outbreak so that our efforts to check loss may be conspicuously successful. The only cost to the owners being in time and labour, which is unavoidable. This alone will give a strong impetus to inoculation treatment for the control of contagious disease, and stimulate voluntary reporting by the owners themselves.

(*c*) It has been found in the case of co-operative milk societies, that once the profit to be derived from accepting Western advice and help has been demonstrated obstruction ceases and the people ask for more advice. I propose through the propaganda departments of the three departments concerned, Agriculture, Veterinary and Co-operative, to seek out every possible avenue by which cultivators can add to their income. These possibilities vary in different districts, and need to be experimented on in each district, and then demonstrated, and finally the local cultivators organised to finance them for themselves. Milk and milk products open a wide field in themselves, to these may be added poultry and eggs for which there is a large market, provided these products can be readily conveyed there at a reasonable cost. Each department should have its own propaganda staff to investigate and take charge of the branches of this work which concern it. The Veterinary Department in Bengal has no propaganda branch, on account of lack of funds.

If this department can demonstrate the value of its advice in rupees, it will be popular. I want to find ways in which the value can be quickly demonstrated so that advice on breeding and feeding will be more readily accepted, as these take years to show much appreciable benefit. For example, in the case of cattle, once the owner really values his animals he will do his utmost to find the money to have them permanently immunised from rinderpest. The milk societies are asking now to have their herds done.

The improvement of the 25 millions of cattle in Bengal cannot be achieved without the expenditure of much money by Government in the first instance and the people themselves in the second.

(*e*) We have so far experienced no difficulty in obtaining the serum we require, from Muktesar.

(*f*) Fees for inoculation.

Government do not countenance charging fees for inoculation, but nevertheless some District Boards charge fees, either to the owner direct or as a levy from Union Boards, in spite of Government protest. Government are not now in a position to insist that their wishes in this matter are carried out. This practice is a very serious handicap to inoculation. The supply of serum at the cost of provincial revenue will overcome this. This has been under Government's consideration for the last 16 months. Finance is again the difficulty, as the cost in Bengal would be from 60 to 100 thousand rupees a year.

(*g*) Provision for further research into animal disease is most desirable. In Bengal we have a small well-equipped laboratory but no specialist officer trained in this work.

Mr. P. J. Kerr.

Each Province should be fully equipped for research, and its diseases studied, in the first instance, in the climate and under the conditions in which they naturally exist. The work of these laboratories should be collected and co-ordinated by Muktesar, and amplified and checked by the Government of India experts. For this purpose Muktesar itself requires extension.

(*h*) See my answer at (*g*). Much overlapping and waste of time could be avoided if the work of these laboratories were under the advisory control of the Director of the Muktesar Institute, and also work which they were unable to carry out could be undertaken at the central laboratory.

(*i*) I do advise the appointment of a superior veterinary officer with the Government of India, provided he is an officer with long experience in India and conversant with the conditions, problems, and difficulties of the work in India. He should visit the Provinces on request. He would then be in a position to give very valuable advice to officers in charge of Provinces. He would be an independent expert to whom Local Governments could refer when in doubt as to the projects of their own Adviser. He should also be the administrative officer in charge of Muktesar. I believe the need for such an officer, distinct from the research staff, has been demonstrated. Research requires whole time work. In this capacity he would direct the work carried on there into the channels most required by the country as a whole, and in consultation with his expert staff co-ordinate the work of the district laboratories. He would also be in charge of the serum production, and distribution side of the Institute. He would be the Adviser to the Government of India on all veterinary matters. He would be head of the Central Bureau.

The post would be the one prize in the whole of India for Veterinary Officers, and would perhaps act as an inducement to men to stay their full time.

QUESTION 16.—ANIMAL HUSBANDRY.—(*a*) This matter has only just been taken up seriously in this Province, and the post of Cattle Expert created. An officer has been selected and his appointment is pending.

(*i*) The formation of a Cattle Improvement Committee of experts, in which the Agricultural and Veterinary Departments combine with the Cattle Expert appointment of a sufficient number of men under the Expert to take charge of the various breeding farms, and centres, and look after the health of the stock. I would suggest Veterinary graduates for this work.

The establishment of several large breeding farms in the Province where the experimental work can be carried out, and from which the smaller centres can be stocked.

As nearly all jails in Bengal have small herds of cows to provide milk for the sick, I propose to utilise these and increase the size of the herds up to the full number the jail will accommodate, replace the present cows which are unsuitable for breeding improved stock, with suitable ones from the large farms, provide for the supply of suitable bulls, and the interchange of these when necessary and use them as distributing centres for improved bull calves for the district in which the jail is situated.

This will be an economical arrangement as the lay staff and labour are all provided free, and in some cases the present buildings are sufficient. In others they would have to be improved and extended.

Veterinary supervision and attendance is provided by the Veterinary Assistant Surgeon in charge of the headquarter hospital.

As funds permit district agricultural farms can be utilised in the same way. But here more expense will be entailed. Extra labour and buildings will have to be provided. In the jail scheme the district farms would be utilised to grow fodder and grain for the jail herds, and probably some help in the matter of labour might be given by the jails.

In this way 26 district breeding centres can be established at a minimum cost.

(*ii*) Dairy work under scientific methods could be carried on in each of these centres, as well as at the central farms. There is a market for milk and ghee, if not butter, at each district headquarters.

Demonstrations of these methods could be arranged at suitable times for cattle owners, also these herds could be shown locally at *melas*, as an example of what may be achieved by good feeding and keeping of improved stock.

(*iii*) Feeding is the most essential factor in improvement of stock. In my opinion, we need, in Bengal, a whole-time Physiological Chemist to investigate the value of various crops grown in Bengal as food for cattle. I believe there is only one such officer in India, at Bangalore. The results of his work on crops grown there are not reliable for Bengal where the crops, climate and soil are entirely different.

(*b*) (*i*) In my opinion, pastures in the Province can never be looked upon as anything but exercise grounds. Cattle should get a full ration of grain and fodder, the amount of grass they can get while out at exercise should be disregarded.

(*ii*) Plantain leaves are eaten extensively by cattle. I would like their food value to be ascertained. If they are good, I would suggest that they are grown round the

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margin of cultivated fields. In many parts of Bengal they grow wild and thrive without any attention whatever.

I also wish to carry out further experiments with "dry silos."

(*iii*) The shortage season varies in different parts of Bengal. In the West, food except straw is short from early cold weather (December) until the rains break in June.

In East and North Bengal the shortage is more marked during the rains when the whole country is inundated, the time of plenty being from the time the water goes down, well on into the cold weather.

(*iv*) Work required by an expert on fodder.

(*c*) I do not think the cattle in Bengal, which depend on grazing for their existence, ever look well-nourished.

(*d*) The growing of Guinea grass and plantains, and other suitable green food and using them with paddy straw, for dry silage.

(*e*) The only way to teach the cultivator these things, is to demonstrate the money value of our advice at his very door. If our crops are better than his, produced under similar conditions, and the extra cost is more than covered by the extra profit, he will be willing to adopt our methods. But he will expect everything necessary to begin with, to be given to him. With cattle he will expect the service of the improved bull free, and the bull stationed near his home. Also every cow he has to be served by this bull whether fit to breed from or not, etc. The only way to show him is to induce one or two more enlightened neighbours to adopt our methods. To find out some way in which he may make a quick profit in rupees through taking our advice. He will then be ready to accept more advice even if the profit is slower in materialising.

QUESTION 22.—CO-OPERATION.—Without going into details, I am convinced that the only way of financing improvement in all the works and methods of the cultivator is through co-operation. The sums involved for agriculture and animal husbandry alone are so enormous that no Government could face them. These do not take into account the money required for public health, education, etc.

Oral Evidence

19135. *The Chairman :* Mr. Kerr, you are Veterinary Adviser to the Government of Bengal ?—Yes.

19136. You put in a note of the evidence which you wish to give before the Royal Commission, and my colleagues and I, are greatly obliged to you for that; and you have also handed in various supplementary documents. Have you anything to say in amplification of the written material which you handed in ?—As an explanation, should any be required.

19137. No statement of a general nature which you wish to make ?—About organisation. As regards Central organisation as well as Bengal organisation, my proposals for reorganisation are on the same lines as those of Mr. Ware. He passed through Calcutta on his way to the Government of India in February and, with the Commission in view, we discussed practically all the central portion. I have seen a copy of the note he submitted to the Commission and I am in complete agreement with his views expressed in that note. Here, in Bengal, we feel the need of a Central Advisory Body. In Bengal, as I have stated, I think in my note, I am not satisfied with the arrangements of the Veterinary Department, nor with the amount of help which it gives in the matter of cattle improvement. Prior to my knowing that the Commission was coming, I was already formulating proposals for the Bengal Government and those proposals have been under consideration now for at least twelve months. The first proposal, the major one, is that all infectious diseases staff and measures should be under the complete control of the local Government.

19138. And not under the District Boards ?—No; arrangements for treatment of ordinary clinical cases should be regarded as local matters. On these lines my proposals have already gone up. The most urgent one I put up, was that the Government of Bengal should pay for the cost of serum from the Provincial revenues, because the present system which is that the cost is recovered from local bodies and supply controlled by them is a great drawback. At present the serum supply is indented for by me under a general allotment from the Government of Bengal, and then it is distributed to the Boards as they indent on me for it. They have to bear the cost of the serum which they indent for; and that is objectionable both from the difficulty of the Boards finding the money for the requisite amount of serum, and the delay which is caused through requisitions coming through that channel.

19139. Perhaps before we go any further, Mr. Kerr, you would just let the Commission have a very short statement of your own training and any past posts that you held ?—I qualified from the London Veterinary College in 1906 and applied a year afterwards for a post to the Indian Civil Veterinary Department. As no post was vacant at the time, I went on in private practice as an Assistant and practised at home in Northern Ireland. I worked for a year in Enniskillen in Aberdeen nine months, Salisbury one year and Warwickshire, London one year. When in 1910 a post was vacant in Bengal, I was given a second post-graduate training. It was a college post; I had already taken one post-graduate course to render myself eligible for the Civil Veterinary Department. In January 1911, I arrived here. I was for about eight or nine months in Bengal and was then posted to the Central Provinces for training for six months and spent that time touring. From there I was posted to Madras for six months in the leave vacancy of Mr. Ware, and spent practically the whole time in touring. I then returned to Bengal and took charge of the district work, from 1912 to 1925. In July 1915 I went out on Military Service, eighteen months of which I spent in Mesopotamia and the balance in Northern India, on the frontier, S. Waziristan, Baluchistan and Ambala. I returned after the War in 1920, and took up a college post and in 1922, I took charge as Veterinary Adviser to the Government of Bengal.

19140. Now a question or two on what you have written for us, about your idea as to the Central organisation and on what you said in amplification of that a moment or two ago. I take it from your note that it is your view that if an officer was appointed in the position of a Veterinary Adviser to the Government of India and in general charge of Muktesar, he could not at the same time take any part in research work ; is that your view ?—Yes.

19141. You would relieve him of all responsibility for the general direction of research ?—No; I think from his knowledge of the needs of the Provinces, he would consult with his expert staff and in that way advise and direct all research. Otherwise problems which are not of first importance may be given a great deal of time to the detriment of more important ones.

19142. And the initiative in a good deal of research ought to come from the districts where the problem is actually being faced ?—Yes.

19143. I suppose you contemplate some one responsible for research as a whole ?—Yes.

19144. And your view is that the Veterinary Adviser to the Government of India would be in touch with the needs of the Provinces and he would say to his Director of Research "this is the problem which requires your attention; arrange to go into it" ?—Yes; it may be necessary. It may be impossible to carry it on in Muktesar itself, it may be necessary for the Central staff to depute whichever officer is competent, to come down to the district concerned and investigate on the spot. Requisitions for material (virus) were made from Provincial Officers when Sir John McFadyean came out years ago to investigate foot and mouth disease. Materials were collected in Bengal, according to instructions given, but the virus was dead by the time it reached Muktesar.

19145. I assume from what you said in your note that you are quite definitely of opinion that the Central Veterinary Service should be under the Veterinary Adviser and not under the Agricultural Department?—Yes; I am. I think both are whole-time jobs. The Agricultural Adviser has not time to give necessary attention to the work and we have more than enough for one man on whole-time duty.

19146. Do you contemplate any teaching being given at Muktesar ?—I have given a personal opinion about it and we have also discussed that as a department and it needs further discussion.

19147. You do not wish to go any further now than that ?—Not at present. I have said that, as regards direct recruitment to the Provincial Service in Bengal until such time as a suitable course is provided in India, I want to maintain the M.R.C.V.S. degree as the standard for direct recruits to the Upper Provincial Service.

19148. Now you have interested yourself a great deal in the cattle problem ?—Yes.

19149. In your view is it likely that a cross between an imported bull and an indigenous cow will make any contribution towards the cattle problem in the Presidency as a whole ?—Yes; I think it will in the market of milk production only. But we have not had sufficient experience of it in this Province. All cattle imported into this Province degenerate. If you are not very careful, degeneration commences at once and increases in each succeeding generation.

19150. Leaving out the question of milk-supply, the problem is to discover the dual purpose animal capable of providing strong draught oxen and also of providing cows capable of giving remunerative yield of milk ?—Yes. But the difficulty is that most of the milk breeds in India are large animals and their bullocks are too large for the average cultivator. You have seen the red Sindhi animal, it is of fair size for Bengal. We are experimenting to see whether the Sindhi animal will thrive in Bengal. We have an experimental Sindhi Herd under the Director. It has been here for about five or six years now, but not long enough to give an opinion as to its suitability.

19151. What are the local conditions that make it necessary to have a small draught animal ?—First of all deep ploughing is not required and the plots are very small. Buffaloes are used to a certain extent but the objection to them is that they are too slow and too large. A small light animal (bullock) gets through the work more quickly, is more easily handled and is sufficiently strong for the depth of ploughing required.

19152. Is it your view that the oxen in this Presidency are on the average strong enough for the work ?—No; the indigenous cattle are too small.

19153. Something between the large up-country beast and the weedy bulls working in the fields; that is what you have in mind ?—Yes, we buy an enormous number of the smaller Bihari cattle; they come to us in thousands every cold weather from Sonpur and other parts, trainloads of them pass through from Bihar to Bengal.

19154. Do I understand that you think an animal with a European strain in its veins is likely to provide the cultivator with what he wants ?—I do not think the importation of European or Australian stock will meet the case. No importation has proved a success so far.

19155. The two problems are separate in your mind ?—For milk production in bulk it does pay; it is not a proposition for the whole of the Province.

19156. So that, leaving out the alternative of buying from outside the Presidency, the alternative left is either to proceed by selection to improve the breed or to cross two or more indigenous breeds ?—I have thought of importation of indigenous Indian breeds to improve the strain, but we have not had sufficient experiment here to decide what strain to import.

19157. So, you are now on the eve of tackling this problem ?—Yes.

19158. You are not doing any breeding work here at all; you are importing your animals from areas in India where they are bred. That is really what is going on at the moment; you are not breeding your own animals?—They are bred, but not to any great extent. If people want good cattle, they buy imported ones and sell them as they become useless.

19159. What is the total number of cattle in this Presidency? I do not know the figures of the latest census; they are in proof at the moment?—I too have not the latest figures, but the last census figures were 25 millions.

19160. I want the number that is imported?—That I have not got, but it runs to many many thousands.

19161. Can you give any approximate figure?—No. Many thousand come in annually by road and rail from Bihar.

19162. Can you say that half the animals that come into work for the first time in the Presidency in each year are imported?—I cannot give figures as to that.

19163. Apart from improving the breed, what is the most important contribution that could be made to the improvement of cattle in the Presidency?—First of all feeding those we have, and secondly protecting those that are worth protecting from being carried off by infectious diseases.

19164. Take the first point first. What is your view about the best way of solving the feeding problem?—I think the only way is to grow forage crops, and to adopt a satisfactory method of saving those forage crops, from the time they will grow in plenty and with the least attention, until the time of shortage.

19165. Have you thought out this problem in relation to irrigation at all?—No, not in connection with large irrigation. I know for a fact that these crops will grow if they are irrigated by primitive methods. We have a fairly large garden crop at the college here irrigated in this way. All the crops grow there satisfactorily with tank irrigation. For many years we used basket lifting. A number of crops are grown for feeding animals in the hospital.

19166. Having persuaded your cultivator to set apart part of his land, for a part of the year, to growing fodder, what means would you suggest of preserving fodder?—Silage has not so far been very helpful in Bengal but I do not think it has been tried sufficiently long either to approve or to condemn it. The old Danish method was the one I wanted to try, and the Agricultural Department are now trying it on their farm at Dacca. That is what I call dry silo. That is merely chopping up the straw and green food together, adding a little salt and storing it.

19167. You do not get fermentation?—The salt prevents fermentation. It is the method advocated in Sheridan's book, and it is being tried here. I thought it might be experimented with to see whether it was a success or not. It is a method that the cultivator can adopt, inexpensively, himself, if it is satisfactory.

19168. You do not yet know whether that silage will withstand the climate?—The dry silos were filled about three months ago; so, I cannot say.

19169. What are the special conditions which made the ordinary silos difficult to manage?—As far as I can understand they require a little expert knowledge, as to the right time to cut the crop, and the right way to fill the pits. It is not very much, but it seems more than the average cultivator can manage. They are very haphazard in all matters. There is also the water problem. Pit silos in a large number of Bengal districts are not a success because almost invariably they form wells instead of silos. To build a pucca silo for the silage is too expensive for the ordinary cultivator. That is why I propose dry silage. I propose keeping the grain in a sort of matting shed built on posts, *gola* they call it. These are already being used for storing paddy in some districts.

19170. When people are talking of improving the breed they generally stop short at the good bull. Do you not think the condition of the cow is very important too?—It is very important indeed.

19171. Do you think the cultivator has any idea of improving the cows?—I wanted to point that out. If we give them a good bull, they expect it to serve every cow they have, irrespective of whether the cow is fit to breed or not. Elimination of the unfit is a difficult problem in cattle improvement in Bengal, one-third of the cattle in Bengal we would be better without. These weedy animals eat up the little food there is, that would better be given to the more valuable animals.

19172. I take it if there is any shortage of fodder, the working beast gets a very much better ration than the cow can hope for?—Yes.

19173. As long as the cow gives some milk the cultivator does not worry about it ?—If it continues to give milk, they give it a little food ; when it ceases to give milk, they leave it to pick up what it can by grazing. In many parts of Bengal, milk is not valued.

19174. On the matter of dispensaries and Veterinary Assistant Surgeons who, according to your note are under the control of District Boards, would you like to tell us some of the ill-effects of that system as you have experienced it in practice ?—The first point is that the District Board finances are limited ; they have many things to do with their money ; roads, public health and so on. A large number of members of the District Boards do not appreciate the need for veterinary work. They look on veterinary work as a luxury which is desirable but not essential ; and there seems to be a general tendency to economise, when times are hard, first of all on the veterinary staff. At present, we have only half the number of staff approved, half of what I regard as the minimum cadre for infectious disease work ; these men, in addition to coping with the infectious diseases work, have to do dispensary treatment and routine touring in the districts.

19175. The approved number of officers being the number approved by the Provincial Government ?—Yes, approved by the Provincial Government originally in thinking out what their Veterinary Department should have.

19176. Are they actually under the administration of District Boards ?—The local bodies have to create the post ; they ask me to supply the man ; they contribute his average salary to Government, and Government pay the man.

19177. The picture presented to my mind is that the local bodies are saddled with more responsibilities than they have funds to discharge ; do you think that is a true picture ?—Yes, but I am not quite certain that if they had more money, we should get a share of that money. In the cadre which was originally laid down, it was proposed to have two V. A. S. in each sub-division, one in charge of the dispensary and the other to do the itinerant work. In very few sub-divisions have we got two men now ; in few districts only do we have a stationary man as well as an itinerant one.

19178. Does the devolution of responsibility to the local bodies affect the question of discipline ?—It does. In a number of cases, the veterinary assistant works one master against the other. He either blames the District Board for having misinterpreted or contradicted one of my orders or *vice versa*.

19179. Have you had trouble with your subordinate staff in the districts in the matter of corruption ?—I have ; but it is very difficult to detect. I have accusations occasionally that they try to charge fees for their work. The corruption that is very difficult for me to check relates to their attendance at the outbreaks, the number of animals inoculated and the serum they use. I have had a case in which a man poured away the serum without ever having inoculated any animals. This is an extreme instance. One finds *budmashes* in every service ; generally speaking I have little complaint of corruption among my veterinary assistants. I think, however, that they need thorough inspection to keep them to their work.

19180. Have you an adequate inspecting staff ?—No. I am asking for more, an average of one inspector for ten veterinary assistants. I need more superior staff.

19181. Your idea is to extend your clinical dispensaries by getting the Union Boards to maintain a Veterinary Assistant Surgeon and a dispensary at each *thana* ; is that the idea ?—That is the ultimate aim. That will give one dispensary to every four or five Union Boards. In the only district in which it is contemplated at the moment, four or five Union Boards are co-operating to maintain a dispensary at the *thana*. That area will give ample work for one veterinary assistant.

19182. I want to be quite certain what a Union Board is. Would you describe it shortly ?—I am not quite certain about the actual constitution of a Union Board ; I think Mr. Gupta could tell you. It is a small unit of Local Self-Government under the District Board. A sub-division may contain seven or eight Union Boards.

19183. You attack the principle of part control by District Boards in a professional service on the ground that the District Boards have not sufficient funds to cope with the work. I wanted to be certain that you did not mean to put your clinical dispensaries on the rates, as it were, through the avenue of the Union Boards ?—My object is this, that the work should be attempted to be done on a co-operative basis by the Union Boards.

19184. On a voluntary basis ?—Yes.

19185. Is there any question of local taxation ?—No. In the district in question on account of the very heavy losses from cattle disease, all the Union Boards have agreed to subscribe and to have their own veterinary assistant. He will

not be a Government servant; he will be lent to them so long as they want him; if they do not want him, his post will lapse. In regard to the infectious diseases staff which I want Government to control, the position of the District Board is not quite clear; it will have to be thought out, as the Union Board men multiply. In the district in which it is proposed to have these men, there are seven *thanas*, and they propose to start that experiment with seven men in the sub-division, and see how it works before going any further.

19186. Given adequate staff, I take it your ambition would be to advertise the value of efficient feeding in relation to the general constitution of the animal, its capacity to work, its capacity to produce milk, and its capacity to resist disease. You would also use the staff to control, so far as possible, epidemic diseases and to administer prophylactic measures?—Yes; it will be both a preventive and propaganda staff; that would be the function of the Government provincial staff; for clinical treatment my idea is to use the local employee of the local body.

19187. Apart from that, have you in view some group of officers whom you could mobilise and move to some point where infection was beginning?—I have already applied for an emergency staff.

19188. What will you do with them at other times?—I can post them out on propaganda work quite easily; they have a very wide field for propaganda, and I could use them the whole time. I should not keep them in Calcutta; I should have to have two or three at Dacca, working in the Dacca areas and others at other headquarters.

19189. If any serious epidemic disease breaks out, you would concentrate those men on the point of danger?—I would call them from the nearest post to the place of outbreak.

19190. In connection with prophylaxis, rinderpest, I suppose, remains your most formidable disease?—Yes.

19191. Have you experience of the simultaneous method of inoculation in the Presidency?—Yes, so far the Government animals have been done, and also, the half-bred English cattle of the Kalimpong Homes Dairy. It was done 18 months ago; up to now the results have been very satisfactory, and we had no fatalities as a result of the inoculation.

19192. Partly owing to its cost and partly owing to the fact that it means disabling the beast for a short period, it is very difficult to have any general adoption of the method of simultaneous inoculation for the cultivators' animals?—There are periods when they could allow their animals to be inoculated if they were willing, but they are not willing. As far as the milk-producing side of it goes, it does not seem to interfere with them in the least.

19193. Are you concerned with the popularisation of the simultaneous method?—Yes, wherever people can afford to pay for it themselves. I think the Milk Unions are desirous of having their animals done; the Co-operative Milk Scoiety people have approached me to arrange to have their "improved" cattle done. They are going to find the money, which will be roughly Rs. 1-8 per head, that is the actual cost of the serum used; the cost of the staff necessary to do it, and all other costs will be a Government charge.

19194. Have you ever charted on a map of the Presidency the movement of rinderpest as it spreads?—No, I have not.

19195. Do you think that the sources of infection or entry of the epidemic into the Province are more in some districts than in others?—It is difficult to accuse any particular avenue, because we have got rinderpest with us always, and it appears to increase in cycles; every three or four years we have an epizootic increase in the incidence of rinderpest.

19196. Appearances of cyclic tendencies and periodicity have always to be interpreted in the light of the fact that, for every year rinderpest is absent in a district, so many more animals have extreme lack of any resistance to the disease?—The main avenue for infection is on the roads from the western fairs.

19197. Has it ever occurred to you that if expenditure is the difficulty, it might be worth at least considering whether you could not spread bands of immunised villages across the districts, so as to prevent the spread of the disease? Do you think it would be a feasible operation?—It is very difficult, because our population is not gathered in communities, but spreads throughout the countryside. There is also the difficulty of getting them to agree; they can only be induced to agree to inoculation when they see cattle dying all around them. When there is no danger, they are not willing to have their animals done.

19198. If you had blocks of territeries with animals which had been immunised, it would be extremely useful in dealing with an outbreak?—I do not think it is practicable from the financial point of view. Also we have got rivers running through the country

in all directions, more or less ; and they can get past your barrage of inoculated cattle, conveying the cattle by river.

19199. Are you recommending any legislation ?—I am not prepared to give an opinion one way or the other, because it wants so much consideration. At present, we have no means of enforcing any legislation, even if we had it.

19200. Do you lean towards provincial legislation or an All-India Act ?—I think an All-India Act, which can be applied to the different Provinces and given effect to according to their different needs would be required but it would be difficult to draw up an Act which would apply to all Provinces without making it cumbersome.

19201. Are you familiar with the work on animal nutrition being carried out at Bangalore ?—No, I am not. I know there is a Physiological Chemist there ; I have met him at Pusa ; other than that I have no knowledge of what he is doing.

19202. Do you regard that as a very important problem ?—I do. I made several suggestions to him verbally, but whether he has done anything about them or not I have no information.

19203. To whom ?—To the Physiological Chemist.

19204. In Bengal ?—I met him when he was up at Pusa last year at the Conference.

19205. *Professor Gangulee :* Did you tell him about your silage experiments ?—I told him about them and asked about the value of plantain leaf as a food for cattle. Plantain leaves are eaten by cattle in many parts of the country, and it does not seem to do them any harm ; I wanted to know whether it was any good as a fodder.

19206. *The Chairman :* But the trouble is that each of these experiments takes so long to carry out, and it is not possible to get through all the possible foods ?—I think it is possible, if taken up in each Province. There may be a number of jungle plants fit for feeding, but at present we do not know whether they are fit or not. Bamboo leaves, for instance, are eaten in quantity in the hills, by the hill cattle, and in the Terai where they grow. Plantain leaves are only used as a ration when other things fail ; plantain trees grow as jungle plants in many parts of Bengal without any attention whatever.

19207. Do you form the view that you have much to learn about the type of fodder crop that can best be grown ?—I think we have still much to learn as to what is the most economical crop district by district.

19208. Is it a local problem ?—It is a local problem which has to be solved by the district agricultural farms. It needs to be the best crop which can be grown with the least amount of labour, because, though the cultivator has much spare time at his disposal, it is usually in the non-cultivating season that he has it. In the cultivating season he will not take up any other work until he finishes his work in the fields, and almost all his time is taken up with cultivation of revenue crops ; it is difficult to get him to take up anything which calls for time and labour.

19209. Have you had much experience of the co-operative organisation in the Presidency ?—The only organisations of which I have any knowledge are the milk societies round about Calcutta, and so far as I can see they are doing extremely well.

19210. Are they co-operative organisations embodying groups of persons engaged in dairying to meet the urban demand ?—It is a subsidiary occupation ; most of these people are cultivators as well. They keep cows and they are organised into local societies under the Co-operative Milk Union in Calcutta. They agree to keep their cows up to a certain standard of cleanliness, and all the cows are milked by the Union's milkers under much improved conditions ; the milk is brought in improved cans into Calcutta, where it is supplied to the consumers by the Union ; the Union finds the purchaser.

19211. Are they milked on the cultivator's own holding, or are they driven to the co-operative sheds for milking ?—For the most part it is done on the owner's own premises. They have tried to get all the cows milked in one place, but the owners are unwilling to drive the animals to a common shed, the milking is done very early in the morning, and the owner is unwilling to get up so early. What happens now is that the Union milker goes round the premises, without the owner knowing it, milks the cows, makes a mark on the record stick and goes away. The milk is then taken to the Union's lorry or depôt.

19212. Who arranges the marketing of the milk ?—The Milk Union.

19213. You have had close experience of this organisation ?—Yes.

19214. Is it working well ?—I think it is working well. They have good customers in the shape of a number of hospitals and a number of hotels. Those customers they have to keep satisfied, because they take many maunds of milk. They have, also, retail

depôts in one or two big markets in Calcutta, where their milk can be purchased retail. They are under a contract with the Corporation not to sell it at a higher rate than 3 seers a rupee.

19215. Is it capable of expansion ?—I think it is capable of much expansion. The actual Union itself has expanded enormously; they are bringing in about 120 maunds of milk a day, and are under an obligation to the Corporation to increase that to 200 maunds in 12 months and to 400 maunds in four years from the time they got their loan. The Corporation has financed them.

19216. Are any of the prize milking cows of indigenous strains ?—They are a mixed herd. Some of them are local but a desire is arising for up-country heavy milking cows.

19217. Is that with a view to getting a market for the bullocks ?—No, it is with a view to increasing the milk.

19218. Is there a market for the male animals for working purposes ?—There is a certain sale for cart bullocks, but most of the people buy these direct from the Bihar markets. They go to the *melas* in Northern Bengal and buy their big heavy cart animals from there. So if you are going to produce heavy cart animals, you would have keen competition. So far, I do not think there is any great market for the large bullocks bred in Bengal.

19219. Do you think it might be possible to build up a dairy industry, apart from the demand for milk, that is to say, an industry resting mainly on milk products ?—I think the difficulty at the moment for milk produce is that you must be in a district where milk is really cheap to make it pay. *Ghi* is the most saleable article and it commands a price of Rs. 90 to Rs. 100 a maund. But you need to have milk at the rate of 8 to 12 seers per rupee before *ghi*-making will pay.

19220. Unfortunately there is a sentimental objection to making or eating cheese ?—They do eat curd, but *ghi* is the most easily produced product but it is an expensive article. The poor man makes it himself if he has enough milk to do it, or goes without.

19221. Are you in touch with the Heads of the co-operative movement ?—Not in close touch.

19222. You have no other experience of the co-operative movement in this Presidency ?—No.

19223. *The Raja of Parlakimedi :* You wish to have a research fund to carry on research work ?—Yes.

19224. How do you propose to raise it ? Do you propose to raise it by a special cess or by what other method ?—I am afraid I did not study the financial side of it deeply, but Mr. Ware has done so; I have accepted his proposal, namely, that the profits which are made by the biological sales at Muktesar should be credited to this fund. The Provincial Governments should also contribute towards this fund. We can also open the fund to subscription. Any department that may wish to avail itself of the researches of this fund should also contribute towards it. The medical people would also contribute to it; in fact, they have shown a willingness to do so. If we only organise a fund, the Medical Department will welcome co-operation at once. I can speak of Calcutta and Madras as I have met the medical research men of both these places.

19225. As regards the field of research, would you not also include food ?—I have looked on food as a problem coming under the purview of the Agricultural Department and their Physiological Chemist. The general welfare of the animal depends upon its food. An animal that is not given good food and is not healthy is more liable to disease of any kind.

19226. For instance, coming to the cakes, do you not think they should be thoroughly investigated to find out whether they are really good ?—It is an economic matter. We all realise, for instance, that mustard cake is the poorest of all cakes and the best is linseed cake; cotton-seed cake is also good, but as we do not grow cotton here, it is out of the question. Linseed cake is expensive and the universal cake is mustard cake. I have at various times heard it accused of causing sterility and causing abortion in cattle and reduction in milk, but I have no evidence to support the accusation.

19227. Has any comparative experiment been carried out anywhere ?—Not to my knowledge.

19228. Has the gentleman in charge of the livestock at Bangalore anything to say about these cakes ?—He did not say anything at the Conference.

19229. Are there any local breeders of cattle in this Presidency?—There is a local breeder at the Kalimpong Homes Dairy but he is not breeding indigenous cattle. Ayrshire cattle are kept and crossed with the hill cows. The object is milk.

19230. So in this Presidency there is no popular breeding of cattle at all?—As far as I know there are no breeders, such as you have in many other parts of India whose sole business is breeding. Our chief difficulty in this Presidency is that none of the real owners have any knowledge of cattle. If you sell them a fat and badly shaped cow, they will be content. But they would not like a lean well-built one.

19231. Have you made any experiments about the suitability of these different Northern India breeds of cattle for this Presidency?—We are running a farm of Sindhi cattle in Dacca as an experimental measure. You will see that when you go to Dacca. They have been in Bengal for five years and they have so far borne the climate quite well. I have not seen a sufficient number of their half-breds to tell you whether the cross between them and the indigenous cattle is a good one or not. We have been using in Rangpur the Hissar type large bull and putting him to the country cow. We have got a cross-bred herd and it is a distinct improvement on the originals. We have also there a country herd which is purely selective. That also is an improvement on its original. One can improve the country beast from giving one and a quarter seers of milk to two and a half by feeding and selection. This country herd has been running for about ten years.

19232. What about the Sindhi cattle?—We have not had them long enough to give you a definite opinion about them. The first result that one can judge from is obtained in ten years, although it generally takes fifteen to twenty years to come to any definite conclusion.

19233. For these rural areas would you not suggest a dual purpose animal?—On that I have kept an open mind. We hope to have an expert who knows more about cattle in India than we do. We have been asking for the services of a Cattle Expert for a number of years.

19234. You wish to start cattle farms in jails. Would you undertake selection or cross-breeding?—It depends entirely on the amount of money we are given. We must start with the best we can; and start as high up as we can. The jail cattle now number 500 roughly. We must select the best cattle we can find and put them in the jails. As far as possible we would use cattle of the central farms but the present herds in the central farms would not stock the jails. We will have to buy bulls also to begin with; we cannot breed them in sufficient numbers.

19235. Of course, you are aware that cross-breeding between Indian cattle and English cattle is a practical failure?—I believe so, except from the milk point of view for the first generation.

19236. Even then, they are susceptible to all the local diseases. Are they not?—That is so.

19237. So, if funds permit, you would rather like to have crosses with indigenous Indian breeds?—For India you must have Indian cattle. We can, however, permanently immunise the English cattle against rinderpest, but there are other diseases which cause heavy loss among them. We have had three bulls imported for Bengal; they were immunised against rinderpest. But the inoculation is not free from risk as you cannot sterilize the blood used as virus, or guarantee it free from piroplasmosis. We have only saved one out of three bulls so immunised. Those bulls cost Rs. 2,000 each. So out of Rs. 6,000 spent on bulls, Rs. 4,000 have been lost.

19238. *The Chairman:* If you could grow the virus of rinderpest on some other medium, your difficulty would be solved?—That is one of the problems which is being investigated at Muktesar. If we could only get virus from some other country free from piroplasmosis our difficulties would be overcome.

19239. *The Raja of Parlakimedi:* Is the foot and mouth disease also very serious as in the case of English cattle?—It is not as fatal. The death rate from this disease is something like 5 per cent. Most of such animals are young cattle or cattle which are worked while suffering from the disease; the latter die of septic poisoning.

19240. Can you get serum in time? How would you solve that difficulty?—If the hospitals at district headquarters are under my charge for the purposes of serum, each district would have its own serum cellar for its own requirements. The moment the stock is depleted in the district cellar it would be replaced from headquarters. To do that, I have got to get money to build cellars, I have been able to persuade two local authorities only to build cellars, according to my specification.

19241. It has not yet been done?—We have a cellar in Dacca at the Government hospital. We have also a cellar at Barisal and the District Board of Mymensingh is

contemplating building one there. Both these districts are outlying districts and there is great delay in the serum reaching there from Calcutta. In order to reach Mymensingh it has to go by train and then by boat and train again so that between these trains and boats there is a great delay in getting the serum to the spot where it is required. From the nearest railway or steamer station it may have to travel 30 to 40 miles by country boat or by road. This applies to Mymensingh and Barisal and many other districts.

19242. Then with regard to your answer to Question 15 (*b*) of our Questionnaire, will you please say in what directions you wish the improvement should be effected ?—First of all there should be a dispensary in each sub-division in charge of a stationary assistant ; that is what is laid down in our stereotyped cadre. The sub-divisions I have left out of my scheme on account of expense. I have only insisted in my scheme on having at least the district headquarter hospitals under me.

19243. How are they supervised at present ?—They are financed by District Boards and supervised by my inspecting staff.

19244. At what periods ?—The Inspector is the first officer ; he inspects at present about once a quarter, to half every year, and either myself or my Assistant Director in the range concerned see them once a year. But in this again, we are hampered for want of funds.

19245. You cannot travel about ?—It is a matter of allotment. The sum allotted to me now which I have to share with two officers who travel second class is Rs. 5,000 whereas prior to 1913-14 the budget allotment was Rs. 6,000 for myself alone ; also since then we have had a 25 per cent increase in railway fares. So this retrenchment and shortage of funds hamper our superior officers touring. The same applies to Inspectors. For example, the money allotted this year has been spent already. I have to ask for extra grant. If I get it, they can tour ; if I cannot get it, they have to sit still.

19246. Then with regard to your proposal on page 99, do you not think that at least at the initial stage half the expenditure should be borne by Local Boards and Government ? You suggest that it should be entirely borne by the local people themselves. You say " I hope eventually to meet the need for clinical dispensaries by working through the Union Boards in co-operation " ?—Yes ; for clinical work, which in England is done by the ordinary private practitioner who attends to cases of all descriptions.

19247. But things are quite different here ?—I want these Union Board veterinary assistants to do the work of the private practitioner in India. If the locality does not want them, it does not engage them. That is their local interest. The only thing we cannot allow the district to arrange for itself is as to whether it takes any steps against contagious diseases or not. That affects all the districts round about and if it is a district in which there is a main road it affects the whole Province. It may send infection throughout the whole Province. It should be under provincial control, so that whatever may be necessary in the district is carried out. If they wish to have veterinary assistants for the clinical treatment to treat their cattle, they must arrange for them and finance them ; if they do not want that treatment, then it is no use my posting the men.

19248. Just at the initial stage do you not think the Government or the District Board should meet such expenditure, just to interest the people ?—A beginning has already been made. There are dispensaries at most district and many sub-divisional headquarters maintained by District Boards. The latter, I suggest, should be a local District Board charge and if the District Board wishes to show the people what should be done they should do it in that way. The fact that people want it, if they are really shown how much benefit it confers, is exemplified in Rangpur district, in this Presidency where the request of the local people is backed up by an interested Chairman. They have seven local dispensaries, the money for which they have found themselves. One or two of the dispensaries are in *pucca* buildings ; some of them are in *kutcha* buildings according to the funds locally available ; in some cases they have to hire the building. At any rate, there, they have realised the need for, and benefit from the work ; once they realised it they have gone ahead and arranged matters themselves and I do not think we should take it entirely out of their hands. We need 700 or 800 veterinary assistants to meet the needs of my *thana* scheme, each assistant costs roughly Rs. 2,000 a year and I think that is too big a burden to ask any public body to shoulder. The necessary staff for infectious disease should be Government's concern.

19249. *Sir James MacKenna :* I think you said that the total cattle population of the Presidency was about 35 millions ?—25 millions.

19250. And your total mortality from Table II of last year's report is only slightly under 32,000 ?—That is what has been reported.

19251. Exactly; you do not have much faith in those statistics ?—No.

19252. What was the medium of collection, the police constable ?—The police notify to a certain extent; but the *chowkidar* of the village notifies the Local Board or the District Board.

19253. You have not much faith in them ?—I have not.

19254. As being probably very far from the truth ?—A number of outbreaks are not reported, let alone deaths; and isolated deaths are put down to snake bite or poison, and not reported at all.

19255. What you really want is a strong veterinary police if I can call it so ?—I want a strong notifying agency. We can never have a sufficiently strong body to notify until we get one Veterinary Assistant Surgeon in each *thana*; then you would get your statistics with much more accuracy.

19256. One more question. Are grazing grounds in this Presidency reserved ?—No; to the best of my knowledge there is no reserve grazing ground.

19257. So there is no control over them at all ?—I believe it is the option of the land-holder to break up or let land for cultivation; and I believe a large amount of Government land has been purloined little by little and cultivated.

19258. *Professor Gangulee:* When was the laboratory in the Bengal Veterinary College started ?—By Colonel Raymond who was the first Principal of the College, about 1908-09.

19259. What researches are being conducted in this small well-equipped laboratory ?—The problems that present themselves are largely cases for hospital treatment. They have a large amount of dog work there.

19260. We are mainly concerned with cattle, you know ?—Yes; but I am telling you the work they are actually doing. In cattle work they diagnose all cases sent up in addition to hospital cases. In the case of an outbreak the veterinary assistant diagnoses and wires for serum, if it is rinderpest. If he suspects anything else, he sends up slides for diagnosis.

19261. The laboratory at the present time is utilised for diagnosis more than research ?—This department has for long been looked upon as merely an adjunct to the Agricultural Department for the preservation of cattle. We do a great deal of work on other animals besides cattle. Dogs carry human diseases and this is quite a serious problem. We also carry out work on elephants, camels and military horses, so that we have all lines to consider. We have a number of elephants in this Province so that even elephant problems should be taken up locally and their parasitology for instance, be investigated. Cattle form only a part of our work, the most important part; but the other animals are also important and should not be neglected.

19262. Have you a parasitologist ?—No.

19263. How do you teach cattle disease or animal disease without a parasitologist ?—We have parasitology. Our course is an abbreviated one and any well-educated Veterinary Surgeon who has taken the course of parasitology himself can teach up to the standard required at present.

19264. Has any cattle disease survey been undertaken in this Presidency ?—No.

19265. So we have no data with regard to the infectionary factor or any other factor in relation to the incidence of disease ?—No.

19266. Do I understand that the Co-operative Milk Union is a federation of a number of societies ?—Yes.

19267. How many societies ?—I cannot tell you the exact number.

19268. These societies are in the neighbourhood of Calcutta ?—Yes; they are within 40 or 50 miles of Calcutta. I do not think they go beyond that at present.

19269. And this Union received very considerable financial aid from the Calcutta Corporation ?—The Calcutta Corporation laid down certain conditions and practically financed the installation of the plant here in Calcutta. They gave Rs. 50,000 or 60,000 at least, if not more.

19270. So without that financial aid from the Corporation, this Co-operative Milk Union would not have existed ?—Certainly it would have existed because had the Corporation failed to grant this assistance the Government was willing to advance the money on loan. The Milk Union is now on a sound financial basis and in a position to go into the market for a loan. The Corporation have taken a mortgage on the plant to the extent of the loan they have given.

19271. So you are of opinion that such Unions should be multiplied throughout the Province near the cities ?—Yes ; they have actually started some in Dacca. They should exist wherever there is a market for milk ; there should be many more round Calcutta.

19272. In your answer to Sir James MacKenna, you have said something about reporting agencies. At the present time what are your reporting agencies in the case of an outbreak of a disease ?—The *chowkidar* is supposed to report to the *thana* and the *thana* is supposed to report to the Chairman of the Local Board.

19273. The *chowkidar* comes to the *thana* and then ?—The *thana* reports to the local authority.

19274. Does it ?—To the Local Board or the Sub-Divisional Officer or the District Board as the case may be.

19275. And then ?—Then the report eventually gets to the veterinary assistant. Sometimes it is reported direct to me.

19276. What time does it take ? Suppose an epidemic breaks out, shall I say, in Backarganj district ?—Sometimes it takes three weeks before the report is received or longer.

19277. With regard to the Veterinary Department, are you satisfied with the existing method of education in the Belgachia college ?—I think the present system of education wants revision ; but I am not prepared to alter our present arrangements until it has been fully considered, because I think it is a question of all-India importance ; I think in this we should move in line with all the other colleges and all should be brought up to the same standard ; therefore I am not prepared to make any alteration at the moment in the Belgachia system of teaching.

19278. You agree with me that the curriculum also is deficient ?—It is deficient. I agree with the curriculum laid down for Lahore and the methods in Lahore. For that we want money and staff, and until the Local Government can give us that, we cannot grade up to the standard that is adopted in Lahore.

19279. You agree that the Lahore curriculum is superior to the curriculum you follow ?—I am of that opinion.

19280. Is it your considered opinion that the District Boards have not fully realised the importance of the Veterinary Department ?—Some District Boards have, but not all. Speaking generally, the District Boards have not fully realised the need for it.

19281. Do you find that the people appreciate the operations of your department ?—When they get help they do.

19282. I presume they do get help ?—The number of cases which are brought to the existing dispensaries is going up every year, and if we had more dispensaries we should have many more treated. The drawback at present is that so many of the people live beyond the distance from which they can conveniently bring their cattle to hospital.

19283. If it is within their reach they fully appreciate the help ?—To this extent ; if the animal gets better they are pleased, if the animal dies they are not. At any rate the dispensaries are increasing in popularity where they exist.

19284. I find from the Administration Report of Bengal that the charges under the Veterinary head is increasing. The expenditure by the District Boards has increased from Rs. 1,71,000 to Rs. 1,81,000. So the District Boards are fully alive to the needs of the Veterinary Service ?—Not fully alive ; some are waking up.

19285. But it is a good sign. Do you carry on any propaganda ?—Only the propaganda that our men can do in the course of their other duties. I have no propaganda staff and so far the total amount allotted for propaganda work has been Rs. 1,000.

19286. You cannot possibly organise propaganda work on Rs. 1,000 ?—Finance is the stumbling block whenever one wants to do it.

19287. *Mr. Kamat :* In this note on the improvement and care of cattle in Bengal, you have given us some figures about the cost of fodder crops ?—I am afraid the cost of fodder crops and all that have been worked out by the Agricultural Department.

19288. Are you quite sure that it has been worked out quite carefully ?—That I cannot guarantee. I do not know on what basis they calculated it. That relates to the agricultural side of the problem.

19289. I believe this note bears your name as one of its authors. Do you share the responsibility ?—I share the responsibility, but I cannot guarantee the accuracy of those figures.

19290. I would like to know how far these figures are correct. What is your experience of the yield of milk of cows fed on grazing and on fodder crops ? Does feeding on fodder

crops raise the yield by 100 per cent or 200 per cent ?—I should not expect more than double the milk from a particular animal in one lactation. Even with good feeding for a series of years, I do not think you can get much more than double. That has been our experience with the country-bred herd fed on fodder grown here.

19291. As a veterinary officer you will say that by feeding on fodder crops the utmost difference it makes in the yield of milk is double. We are told here (*The Improvement and Care of Cattle in Bengal*) that four cows fed on common grazing ground yield milk worth about Rs. 125; six cows fed on fodder yield milk worth Rs. 937-8-0. I find it works out to five times the yield ?—I do not think it is intended to imply that. The point is the crops grown on that area would feed six cows which would give that amount of milk. I do not think there is any suggestion that you are going to convert a 2½ seers cow into a 12½ seers cow.

19292. But the practical effect of that statement comes to that. I believe when agricultural officers or veterinary officers give to the public information affecting the ryots they ought to be more careful to see that their figures are fairly correct. You state that in no case would the yield of milk be more than double. Here, in a book on propaganda for the raising of fodder crops, it is stated that the yield will go up five times. It seems to be an extraordinary proposition ?—That is an interpretation which could be put upon it, but not the intention of the note.

19293. What is not the intention ?—It is not the intention to convey that you can get a 2½ seers cow to give 12½ seers by feeding it on fodder.

Sir Henry Lawrence : Where are you quoting from ?

19294. *Mr. Kamat :* From the note issued for the public (*The Improvement and Care of Cattle in Bengal*) we are told, " Four emaciated cows on grazing ground will produce 1,000 seers of milk per annum, valued at 8 seers to the rupee, Rs. 125. Six cows fed on fodder crops with 3½ seers of grain a day in addition will produce 7,500 seers of milk per annum valued at Rs. 937-8-0 ". Which means five times as much per cow. The witness says that an ordinary cow, even with fodder feeding, would not yield more than double. I think that is misleading the public, and requires modification ?—It requires modification if it can be interpreted in that way ; certainly.

19295. *Rai Bahadur Bannerji :* These cattle-breeding farms are under the management of the Department of griculture. If it be placed under the Veterinary Department, will it improve matters ?—It is difficult to say that. We have only one Province, the Punjab, in which cattle-breeding is under the Veterinary Department, and there it is certainly prospering. But they have had an Expert Officer there from the very beginning, Colonel Farmer, and after him Mr. Branford, also a Cattle Expert, for many years, they also had the benefit of plenty of funds. I think it is more a matter of the individual officer directly responsible, than the department. At present we have not the necessary staff. I think you will be rather duplicating your agency, because the farms now belong to the Agricultural Department and are used for agricultural purposes as well as cattle-breeding. In this Presidency the Veterinary Department and the Agricultural Department help each other as much as they can, and my suggestion, when the new Cattle Expert comes, is to work still more closely together. I am not, therefore, prepared to advocate transfer of cattle-breeding.

19296. As regards your *thana* scheme, all the Unions in the *thana* will co-operate to maintain a veterinary assistant and a dispensary ?—That is actually suggested in the Faridpur district of which I am speaking. The members of the Union Boards held a meeting at the headquarters about three months ago, and they all agreed to open a dispensary at the Police headquarters. They asked whether we would help them to carry out the project. They arranged that the Union Board where the *thana* is situated should pay a higher contribution and those more remote should pay less and those most remote still less. Roughly they have to find Rs. 2,000 per annum between them, and I think it worked out to subscriptions varying from Rs. 200 to Rs. 300. Such propositions are feasible only where the Union Board funds are sufficient to devote Rs. 250 or Rs. 300 per annum to this work.

19297. When the Union Board funds will not admit that, do you think the District Board or the Government should come to their aid ?—I think in this matter the District Board should come to their aid.

19298. And not the Government ?—No. I have looked on this clinical work as of local interest and if the Union Boards are unable to carry on, it is of district interest, and they should apply to the District Board for help ; they will also probably require the District Board to help them with their sub-divisional veterinary officers and with such appliances as the poorer Union Board hospitals will not be able to afford. I propose

that they should work mutually helping each other, and they should appeal to the next Local Self-Government unit above them, either the Local Board or the District Board as the case may be for assistance.

19299. Supposing a District Board, although it has a very strong desire to help an institution like that, has not the funds at its disposal, should not the Provincial Government come to their aid ?—I am not altogether sure of that, because I have never been able to fathom the District Board finances. The District Boards have funds for one thing and not for another, and I should leave it to Government to decide whether the local authorities have put forth their best efforts and if they are unable to do more, I think Government should come in and help if Government are convinced that the local authorities can do no more.

19300. *Sir Thomas Middleton :* On the question of the yield of well-fed and badly grazed cows, to which Mr. Kamat referred, I take it that no actual experiment was carried out and that the figures were only illustrative figures ?—They are illustrative figures.

19301. Now, if we take your illustration it amounts to this, six cows which are reasonably fed would give 2,500 lbs. of milk each per year. We have had a good deal of evidence in going round the country that you can pick out, from most ordinary Indian breeds, animals which if reasonably fed will produce 2,500 lbs. ; we have also had evidence that selected animals from these will rise to 5,000 or even 7,500 lbs. per year. So you have used an illustration which is not unlikely, *viz.*, that from six cows you can get the quantity of milk which you have put down here. We have no information yet as to what the yield of milk may be of starved cows. I should not expect over 500 lbs. ?—Starved cows give half a seer, 1 lb.

19302. The point is that your figures were not based on experiment but were given as an illustration ?—It is only an illustration.

I think Mr. Kamat's point is a good one, that it would be very desirable that you should have experiments indicating the increase that was got under improved feeding and publish the actual results of the experiment rather than illustrations which might be challenged.

19303. I have read with much interest this pamphlet (*The Improvement and Care of Cattle in Bengal*), and there is one question on it which I wish to ask you. You are referring to the feeding value of grasses on the average grazing ground in Bengal. You say, "Such sustenance as there is in the grasses is consumed in the effort of digesting them ; there is no surplus available for body building or milk producing". What is the basis for that statement ?—There is so little grass that they have to walk miles and miles to feed ; that is the idea that is meant to be conveyed. They have to graze over perhaps five miles to get a feed, or spend the whole day in collecting one feed, when they ought to have had two.

19304. You are referring to the quantity ?—To the quantity and the amount of work they have to perform in order to get sufficient food, and that is the position for the larger part of the year. Just after the rains there is plenty, but it does not last long enough for the cattle to put on condition. You will see that for about two months they are well-gorged animals, and the owners can collect to carry home a sufficient quantity for the night feed ; as a result not a few of them look well nourished, but very few of them get good feed long enough to enable them to put on any lasting improvement.

19305. I understand your point. I thought you were referring to the quality of the material ?—Some of the grass here is very good ; *dhub* grass is very good and there are other kinds which are also quite good ; but they do not last long enough ; they flower quickly, after the rains and once they flower their nourishment is gone.

19306. Would you agree that there is no grass of which, if enough of it were consumed by the animal, there would be no surplus available after the digestive process had taken place ?—Grass of that quality can be grown for a short time, and if irrigated you can grow it for a longer time, but if you have irrigation facilities, it is not worth while making pasture. During the monsoon there is plenty of grass, indeed more than the cattle can eat, but after the monsoon it dies down ; if it were possible to save it, then you could keep a cow all the year round on it.

19307. I do not know whether you are familiar with the terms used in connection with the valuation of these fodders, but your statement here amounts to the assertion that the starch equivalent value of the grass is zero ?—I am not actually acquainted with food values.

I understand the sense in which you are using the expression ; I was not clear on that point.

19308. You have referred to the possibility of using the jail herds for improving the breeds of cattle. Are not these jail herds kept exclusively for milk production ?—That is the idea, to provide milk for invalids and so on in the jail; there is hardly ever any surplus of milk for ordinary prisoners; it is for the sick, the weakly, and so on; there are 10 to 12 animals in a jail.

19309. For these herds, the ordinary dairy type of bull would be wanted, so that you would not breed good draft animals ?—At present they are an absolutely mixed herd; you will see cross-bred English, the Montgomery and indigenous cows. Any good cow that they could procure they got. You will find cows varying from 500 to 1,000 lbs. in weight standing side by side. Size has no relative value from the milk yield point of view; they give a seer and a half to two seers and a half whether big or small.

19310. What is your idea of the type of bull that should be used in connection with these herds ? Is it the Sindhi ?—My opinion is that that is the type of animal which we want down here. It serves for average labour purposes, and it is one of the good milking breeds of India; and if we can only benefit by that, we could possibly get a dual purpose animal. Whether we can produce a dual purpose animal or whether we will have to have two kinds of animals for the two different purposes still remains to be worked out in this Presidency. The objection to the Sindhi breed, from the veterinary point of view, is their susceptibility to rinderpest; susceptibility is as 60 to 20 as compared with the plains animal.

19311. I think you mentioned the fact that a certain amount of breeding of dairy cows was going on in the hill districts in Bengal ?—Yes.

19312. What is being done there, are they using the cross-breds ?—They are pursuing no very definite policy up there. The Kalimpong Home for children, which is a charitable institution, has about 700 to 800 indigent children. The institution is trying to run its own dairy. They had presented to them, some years ago, six Ayrshire cows; now there only two remaining. From these they had a number of bull calves, which they distributed or sold locally to the hill people, and you can see the effects of these bulls on the local cattle; you will come across the Ayrshire colouring and in many cases humpless animals. They have been breeding a mixed herd of good milking hill cattle which they have crossed with the Ayrshire bulls; they retained the heifer calves to see whether they would come up to their requirements; if they were poor, they sold them to the local inhabitants round about.

19313. Are they making any systematic attempts at improvement ?—No. As far as I understand, their idea is to keep going a half-bred milking herd.

19314. You suggest that in connection with these cattle farms it would be desirable to employ veterinary graduates to look after the stock ?—That is rather a loose statement. With regard to the farms which are now under the Agricultural Department, I would leave them there. My point was that I would like to have a veterinary surgeon to look after their feeding and their treatment in health as well as in sickness.

19315. One veterinary surgeon for about how many cattle ?—In Rangpur the farm has about 200, and I think in the Dacca farm it is about 100; I do not know actually the number of the Dacca herd.

19316. Are there any special conditions in India which make it desirable that a practice we have not adopted in Europe should be adopted here ?—My impression is that the Indian who has spent three years learning about animals would much more easily learn animal husbandry than the man who has had a general agricultural training, plus dairy training, and perhaps a further course on animal husbandry.

19317. I think that is rather a special condition which does apply to India ?—The point is that we cannot draw on men from the hereditary breeder class, who know a good animal when they see one, and understand cattle generally.

19318. Hereditary breeders do not exist here ?—No, not in Bengal.

19319. There are other points which I would suggest to you. The incidence of disease is relatively much higher here than in England ?—Yes.

19320. The difficulty of getting professional assistance is very much greater here ?—Yes. In Dacca for instance, there is a veterinary assistant in charge of a hospital; he is always at the call of the farm there, but as a matter of experience we found that the officer in charge of the farm has not appreciated the necessity of calling him in except for emergencies. He does not always do so for minor things. He does not see the necessity of taking action except in case of emergencies.

19321. *Sir Henry Lawrence :* In connection with the control of contagious diseases, you recognise, I think clearly that the question of notification is the trouble ?—I have found

that trouble not only in Bengal but in every other Province; it is almost universal in India. If there is a delay of three or four days in notification, no penalty attaches; or, if they lose sight of it altogether and never send up any notification, again there is no penalty attached. It is a matter which wants taking up thoroughly; I believe the same absence of notification of disease and death is found in the Medical Department. That is why I have put in a note that the agencies used for the notification of cattle disease may equally well be adopted for human disease.

19322. I have some difficulty in understanding the means by which you would penalise people like the Chairman of Local Boards and Unions, etc. What machinery would you suggest?—It is for Local Self-Government to devise some methods of penalising; I cannot possibly do that.

19323. It is perhaps fortunate for you that you have not to devise methods for the purpose?—The difficulty under Local Self-Government is that, however essential a measure may be, Government are not in a position to insist upon it and enforce it; it is more or less moral persuasion.

19324. What is the system of notification in England, for instance?—The agency at Home is the local Veterinary Surgeon; if he fails to notify any scheduled infectious disease, he is penalised. He has to report to the local police, the local veterinary inspector is sent and has to diagnose the case, and after he has diagnosed, if it is more than one case, the whole matter is taken out of his hands and dealt with by the central authority.

19325. *Dr. Hyder:* You import a large number of Montgomery cows and Sindhi cows from the Punjab?—A large number are imported privately; we have a large market for them in Calcutta.

19326. Has the Milk Union got any of them?—It has got some Sindhi bulls, not many; they have been bought as an experiment, and were selected by the Imperial Dairy Expert; they come of a milking family. The experiment has only started, their first batch of calves are to be shown in January next year, 1927, and we want to see the effect of the cross with the local animal.

19327. It is alleged that the calves of those cows which come from the Punjab and Sind do not thrive in the climate of Bengal and Calcutta; is that true?—The Montgomery breed has given trouble at times, but one cannot make a sweeping statement like that. They must be kept under good conditions before an opinion can be given. There are Europeans who keep these animals, but even so conditions are not ideal, as a rule they are over-fed. The other accusation against the Montgomery breed is that it milks heavily but for a short period, and that there is a long dry period. I have had numerous complaints from people that they could not get the cows to hold to the bull again; they take the bull but they seem to have gone barren for no reason that one can give.

19328. Have you come across any disease, or dysentery from which their calves suffer?—Diarrhœa in some cases, sometimes white scour. The former is usually a result of wrong feeding.

19329. Over-feeding?—I should think it is usually from under-feeding; so much milk is wanted for sale that the calf is kept fasting too long, and then gets a large feed.

19330. Tell me as an educated man what you think of these indigenous cow doctors; do they know anything or are they purely bogus?—My general impression is that the whole lot almost without exception are rogues. They are very much like the camel doctors of whom I had experience as a military officer. They practise firing the rump of an animal to cure it of disease affecting the head.

19331. *Sir Henry Lawrence:* You mention that the susceptibility of Sindhi cattle to rinderpest is 16 to 20 per cent. greater than with other cattle?—Yes.

19332. Where do those figures come from?—They are issued from our headquarters, Muktesar. Where 20 to 40 c.c. serum would be a sufficient dose for an ordinary plains animal, a Sindhi beast of the same size requires 60 to 80 c.c.; to a hill beast 90 to 100 c.c. and a European beast of the same weight one would give 250 c.c. (*i.e.*, per 600 lbs. body weight). That gives a relative idea of their susceptibility.

19333. Where are those figures collected from?—I cannot tell you how they were worked out. They have been issued to us for five to six years now as a guide for the serum-simultaneous method.

19334. Do you regard those figures as a satisfactory guide?—They are all the guide we have and I have found them satisfactory. I have no cattle in my charge with which I can experiment; in doing this inoculation my tendency always is to overestimate the protective dose of serum rather than underestimate it.

19335. Take the case of the susceptibility of the European animals; on what number of cases would that figure be based ?—A large number of military dairy cattle has been done. I cannot say how many. Pusa has also been importing cattle.

19336. You think the results are carefully collected at the source and communicated to Muktesar ?—The method of their collection I do not know; I have never been stationed at Muktesar.

19337. As experience has increased, have you had the percentage table altered ?—We have not so far, but the results of further experiment are sent down to us periodically. For instance, at first they told us it was not safe to inoculate an animal after she was three or four months pregnant later this was modified. It may still be so with European stock. With country cattle you can inoculate an animal that calves during the ten days it is in the inoculation pen without any ill effect; it has happened several times here. We tried it with Government animals to see whether it was safe; a number of animals that were due to calve within a fortnight were given the usual dose, there was no disturbance at all and they calved perfectly all right.

19338. Do you find that those doses are in fact suitable ?—Yes, they are. There were very few reactors in the pure plains animals. The doses advised are calculated to blot out all reaction and it does so in most cases, save perhaps a slight febrile reaction at the third or fourth day after the virus is given.

19339. *Mr. Kamat:* Can experiment as to fodder feeding be of value unless it is conducted on the same strain of cattle; it is no use telling the cultivator that some other breed of cattle gives a large quantity of milk when fed on a particular fodder. Do you agree ?—Certainly.

19340. My point is that it is no use for purposes of comparison telling the milkman that some other herd of cattle gives as much as 5,000 lbs. of milk per head. What you must prove by your experiment is that the same strain taken on dry common grazing may give that quantity of milk if put on fodder feeding. Do you agree ?—Yes, I see your point.

19341. For purposes of comparison you must take the same strain of cattle ?—Yes.

19342. You also agree that agricultural propaganda suffers in the eyes of the cultivators by over-statement and by giving as instances the most favourable cases ?—I see the point.

19343. *The Chairman:* You know that it is proposed to appoint an animal improvement officer in this Presidency ?—A Cattle Expert.

19344. Yes, if you like to call him that ?—Yes.

19345. Do you yourself think that a Cattle Expert ought to be under the Agricultural Department or under the Veterinary Department ? I do not think it matters which.

19346. You do not hold any strong views on the matter ?—No, I have no strong views on that matter.

(The witness withdrew.)

Mr. PRABHAT CHANDRA CHAUDHURI, Deputy Director of Sericulture, Bengal, Berhampore (Murshidabad)

Replies to the Questionnaire

(*Answers have been dealt with from the point of view of Sericulture*)

QUESTION 1.—(*c*) Although the present programme of the Government nurseries about the issue of disease-free seeds of indigenous multivoltine varieties of silkworm is essential to success in silkworm rearing, it is nevertheless true that the production of cocoons to be successful for any industrial use, is controlled to a large extent by the natural limits of climatic conditions in the rearing areas. From a sericultural point of view it has been observed that even localities situated at a distance of 30 to 40 miles apart exhibit marked difference in climatic condition and the rearing of the same variety of silkworm during the same season will imply a good crop in one locality and failure in the other area. To utilise the productive capacity of each variety of silkworm to the fullest advantage it may be useful to undertake the following investigations in addition to the present programme :—

(1) Climatic survey of the different rearing areas to study the variation in temperature, humidity, rainfall, directions of wind, etc., with a view to determine the best periods of rearing.

(2) The production of cocoons of the different breeds of silkworm—indigenous and exotics,—during different seasons with a view to determine the best yielding variety of silkworm for each season for that particular locality.

QUESTION 2.—Since 1910 the Sericultural Department has been providing one year's course on sericulture to the sons of professional silkworm rearers at the Berhampore Sericulture Nursery and the Rajshahi Sericultural School. The Bengal Silk Committee has recommended the transference of the Sericultural School at Rajshahi to the Piasbari Sericultural Nursery in Malda as it has been found that the boys trained in the nurseries are better equipped for taking up the profession of silkworm rearing.

(*i*) Yes ; training in Government nurseries will require only a small additional staff.

(*ii*) Yes ; in all silk-rearing districts ; owing to the demand for training, primary classes have been started in most of the Government nurseries for training the younger sons of the rearers up to the lower primary standard with practical training in sericulture. These classes are receiving contribution from the District Boards.

(*iii*) A literate rearer who has served in a Government nursery may be preferred for teaching in rural area, but I do not think that any restriction will be useful.

(*iv*) The attendance in the sericultural classes is less numerous than in the past owing to rise in wages of labour. With a stipend of Rs. 10 per month as is now paid to the sericultural students, the boy is not contributing towards the income of the family. Recently the Bengal Silk Committee has recommended the taking of sons of rearers as labourers in the Government nurseries at the rate which is paid to the higher type of labour now employed. These students are made to work in the nurseries and to perform all the work involved in running the nurseries. The demand for such training will be greatly increased if a guarantee for loan free of interest for three years and thereafter at 6¼ per cent. interest may be given to the successful students for the improvement of their rearing houses and starting model nurseries for seed-growing in their villages.

(*v*) The grant of a reward of Rs. 400 to each successful student as is paid at present for the construction of rearing houses and working as seed-growers. Service in a Government nursery is also an attraction.

(*vi*) Pupils in sericultural schools are mainly drawn from the rearing classes.

(*vii*) I do not think that the present course of study in the sericultural schools requires much modification.

(*ix*) The majority of students who have studied sericulture are working as silkworm seed-growers in their villages.

(*x*) Sericulture to be made attractive to middle class youths should offer them employment in Government nurseries. If a few seats are reserved for middle class youths in the sericultural classes in the Berhampore or Piasbari nursery they may compete for the reward of Rs. 400 or loans free of interest for a period of three years and thereafter at 6¼ per cent may be granted to the successful students to start seed-rearing nurseries. Even then, the middle class youths are not likely to succeed if they take up sericulture as a profession unless the department undertakes the supervision of their work and also arranges for the marketing of their produce. This has been experienced in the case of several gentlemen who have started nurseries for silkworm rearing.

(*xii*) The adult rearers are mostly illiterate. They should be taught by demonstrations and observations. Lantern lectures on sericultural subjects will be useful. This department has already prepared a series of lantern slides on sericulture with reference to rearers' needs and demonstrations on these lines will be shortly introduced.

QUESTION 3.—(*a*) At the Bengal Silk Committee meeting held on the 6th May 1925, Mr. Peddie (Collector of Malda) emphasised the need of taking up demonstration and propaganda as he considered "that the department was performing only half its function if it merely confines its attention to the production of disease-free seed which is taken to houses infected with disease and thereby lost in the first generation." Although this has been keenly felt for a long time, no steps could be taken to supervise the rearing in the villages and to demonstrate the improved methods excepting in the case of the seed-growers who are growing seeds under departmental supervision. In view of the urgency, work was started since May 1925 in a few villages through the staff in the nurseries. The enquiry of the Director of Agriculture, Bengal, and the Collector of Malda showed that the demonstration was highly successful as in several villages where the rearers had complained that they had failed previously to get any crop, the crops reared under departmental supervision were highly successful. Similar tests in different areas showed that the output of cocoons may be increased by 25 to 40 per cent. through proper guidance during rearing and the adoption of preventive measures against outbreak of diseases. In view of these striking results nine posts of demonstrators and one District Inspector have been sanctioned for the district of Malda during this year and the work has been started since August 1926. The silk area in Malda has been divided into nine blocks under one demonstrator in each centre. The duties of these officers consist in the training of the rearers and supervising their rearing to adopt timely preventive measures.

As a result of these demonstrations, many rearers have now fitted up the doors and windows of their rearing houses with wire nets to prevent the attack of flies and at the same time to have proper ventilation which was a serious defect in the past. The sale of sulphur disinfectants and wire nets in these areas are increasing. Each demonstrator has under his charge sufficient stock of these articles for sale amongst the rearers. The Collector of Malda is considering the question of granting licenses for local sale of sulphur as at present a rearer has to travel a distance of several miles to secure a seer of sulphur from the town.

(*c*) The rearers are quite eager to follow departmental advice and instructions. The improvement in sericulture will depend considerably on the improving of their rearing houses and appliances. The grant of loans through co-operative societies for purchase of materials or the sale of these articles on the hire purchase system will probably be helpful. Several societies have been started and arrangements have been made to secure wire nets direct from the Calcutta dealers so that they may get these articles in Malda at Calcutta price.

(*d*) In 1921 the Collector of Bankura requested the Director of Agriculture, Bengal, to take up investigation on the improvement of silkworm rearing as the industry was practically getting extinct and the rearing areas were proscribed under the "Criminal Tribes Act." By supply of disease-free seeds from the nurseries and supervising the rearing in each rearer's house the yield of silk from the same area under mulberrry was raised from three seers of silk to six seers. The rearers were very unwilling in the beginning to follow the instructions of the officers and even refused to take seeds free of cost. The success attained in one village have now been extended to other villages and at present the rearers in 27 rearing villages in this district are purchasing departmental seeds at the usual rates. In view of the striking success of demonstration in Puniasole village the Superintendent of Police requested the Director of Agriculture, Bengal, to start demonstration in Siromonipur as he apprehended that the rearers would take to crimes through decline of their silk trade. The moral effect of demonstration in Bankura is evident from the decrease in crimes in these villages. In cases where failures have been noticed it has been due to neglect in observing instructions and keeping the worms poorly fed to rear more worms than is desirable. In fact in most of the rearing centres, the silk-worms are given less nourishment than is necessary.

During my recent visit to the village Dharampur in Malda on the 6th November 1926 one rearer Janeswar Das told me in the presence of other rearers that his worms had an attack of muscardine at the third moult and the crop was saved through the timely precautions adopted by the demonstrator. By fumigation with sulphur, washing the rearing appliances with copper sulphate solution and by daily cleaning of litters with threadnets this rearer could get three maunds of cocoons where previously, if a similar occurrence happened, the crop was a total failure.

Similar cases have been successfully remedied in the demonstration centres in other areas in Malda, Murshidabad and Birbhum, etc.

QUESTION 6.—(*a*) (*i*) The survey of the silk industry in different silk-rearing districts has only been started since September, 1926. Up to date we have not been able to survey more than one-third of the actual area in the district of Malda and Murshidabad. The figures given by the rearers about their income and indebtedness are seldom reliable. Some may show their indebtedness to be more than is actually the case in the hope that they may get some special loans at concession rates from the Government. Others may on the other hand conceal the real facts in the apprehension that they will lose their credit. From the surveys made uptodate I am inclined to consider that the indebtedness amongst the silkworm rearing population is much less than in the case of the reelers and weavers. The causes of borrowing may be attributed to :—

(1) Social custom, *e.g.*, marriage dowry. Amongst the rearing classes—the *poundarikas*—the man willing to marry has to pay a certain amount to the father of the girl. This value is less for a little girl than a grown up one. Consequently in the start of his life a rearer has in most cases to begin with debts unless he has sufficient savings. The high interest also increases his liabilities.

(2) Illiteracy of the rearer and the want of foresight to meet his expenditures within his income. The rearers in the villages adjoining towns are taking to indulging in luxuries which they could have easily avoided if they had a little less credit to borrow from the village *mahajans*.

(3) The debt of the rearers is mostly a running debt incurred for the price of seeds and purchase of leaves repayable at the end of the harvest. If he has a good harvest and can sell his cocoons at a fair price he pays the total dues with interest, Otherwise this is carried over for two or more crops.

(*ii*) The sources of credit are mainly the village *mahajans* excepting in places where the people have organised rural co-operative societies. Many rearers also get credit from the reelers in advance for their crop.

(*iii*) The village *mahajans* are to a great extent responsible for the non-payment of the debts as until they know that it is not safe to continue lending, they will seldom give reminders for the payment of the capital. In many cases interest is allowed to accumulate so that the whole property mortgaged may be secured at nominal value. The rearers who receive advances from the reelers usually have to sell the cocoons at a very cheap rate in comparison to market price, thereby reducing his profit.

QUESTION 17.—(*a*) The system of mulberry cultivation as bush plantation prevalent in Bengal enables a rearer to get from four to five crops in the year. He can get work for the whole year if he carries on silkworm rearing on a large scale and produces all the leaves required in his plantation and maintains his paddy lands and other agricultural crops for his family consumption. In view of the fluctuating condition of the silk market and also owing to the need of great watchfulness and practical experience in the management of the silkworms, it is not wise to recommend such a step. It is safer to take up sericulture as a subsidiary industry unless one has sufficient experience in this work and capital to lay out for the purpose. In Malda, sericulture may be considered to be the major occupation of many cultivators specially in areas where there are high lands without facilties for irrigation. But even in such cases after a mulberry plantation is four to five years old, mango plants are set in such plantations and the mulberry plantation abandoned after the mango trees are grown to a height to make mulberry growing impossible in the shade. Similarly old mango gardens are reclaimed to be set in for mulberry plantations.

The female members in a rearer's house usually spin *matka* yarns from the pierced or rejected cocoons as a subsidiary occupation. Many rearers have also one or two reeling basins to utilise the spare hours for reeling.

(*b*) It can be stated without hesitation that silkworm rearing is highly suitable for introduction as a subsidiary occupation by growing mulberry as trees or for making hedges marking boundary lines on lines similar to what has been adopted in Japan. It is estimated that one-fourth of the entire quantity of mulberry leaves used in the silkworm industry in Japan, *i.e.*, about five million pound worth of raw silk is produced by this means. Spinning of pierced cocoons (*matka* yarn) and the reeling of cocoons may be introduced in these areas after silkworm rearing has been sufficiently extended. Growing of mulberry tree will imply at least a period of four years and as hedge plants three years before silkworm rearing can be taken up. This period may be reduced by supplying two years old plants for trees and one year old ones for hedges. It is doubtful if the extension can be done without free distribution of plants and also giving loans for making fencings to guard against cattle. Hand spinning of pierced cocoons (*matka* yarn) and reeling of cocoons may be introduced after the silkworm rearing has sufficiently extended in the area. This will solve market difficulties regarding the sale of cocoons.

Mr. P. C. Chaudhuri.

(*c*) The obstacles in the way of extension of sericulture in areas where silkworm is reared are :—

(*1*) High rent of mulberry land in comparison to agricultural crops ; *e.g.*, in Murshidabad the rent of mulberry land is from Rs. 5 to Rs. 10 per *bigha*.

(*2*) The gradual disintegration of the joint family system in villages.

(*3*) The heavy cost of cultivation under the bush system—higher wages of labour and the increase in the price of cowdung for manures.

(4) Disunion in villages as compared to the past. Many rearers have complained that they are losing their silk crop through fly-pests as all the rearers in the same village are not rearing the same stock of the same dates of spinning with the result that the fly-pest is able to find a ready host throughout the year. There are many such salutary measures in village life which are greatly neglected in the present day.

(5) Scarcity of labour for cultivation and rise in wages. Many big rearers are experiencing this difficulty.

(6) Want of commercial organisation and proper marketing facilities.

In the extension of sericulture in new areas although the mulberry plants may thrive well in these localities, the first determining factor should be the tests with silkworm rearing. If worms can be grown successfully and the economic factors are also suitable, the chief obstacle will be the marketing of the cocoons until there is local manufacture of silk yarns and fabrics.

(*e*) The starting of silk-weaving factories in areas where silk reeling is prevalent will give them subsidiary occupation and also induce them to reel better silk according to the requirement of the weaving concern. If weaving factories are established in areas where silkworm rearing is extensive, it may induce the silkworm rearer to reel the cocoons to be able to sell yarns direct to the weaving concerns. The unemployed boys in the village may find employment in the weaving factory.

(*f*) Yes ; I would suggest particularly the need of introduction of improved hand-spinning appliances for *matka* spinning, improved appliances for reeling and twisting of silk, improvement of handlooms.

QUESTION 20.—(*a*) The existing market facilities for selling silk cocoons and yarns are very unsatisfactory and the rates are always fluctuating according to the terms offered by the middlemen.

The sale price of silk cocoons is controlled by the price offered for silk yarns. In the absence of an organised local market for silk yarns through the decline of the silk-weaving industry, the bulk of the silk yarns reeled in this Province are sold to other Provinces through the Marwari businessmen who have practically the monopoly of the silk trade in the present day.

The Marwari merchants offer a rate to the reelers who depute their agents to the silk rearing villages to secure cocoons at a rate not exceeding a rate fixed by the reeler. The agent will no doubt keep something for his profit and offers as low a rate as possible to the rearer. Where the cocoon rearers have reeling in their neighbourhood, the profit of the reeler's agent can be reduced by dealing direct with the reeler.

In his dealings with the Marwari merchants for the sale of his silk yarns, the reeler cannot always place confidence on the rates offered as it has been found that in many instances after he has brought his silk yarns to the godown of the Marwari merchant, the latter tries to force the reeler to part with his goods at a much lesser rate than he had originally offered. In this passage of sale from the cocoons to the silk yarns it often happens that the goods have to pass through two or three intermediaries to the loss of the actual producers. Of these the village sub-agent for collecting cocoons and the agent of the reeler are superfluous intermediaries.

A proposal for the establishment of a silk union is now under the consideration of the Registrar of Co-operative Societies so that the reelers may sell their yarns direct to the weaving concerns in other Provinces and secure loans on cheaper interest to be able to carry on their reeling and rearing concerns without negotiating through middlemen. If this silk union is started it will probably result in the starting of similar organisations on co-operative lines to the improvement of the industry. The extension of silk-weaving will also help to remove the marketing difficulties.

(*c*) (*i*) The Indian market is principally concerned with the use of the silk yarns by the handlooms and is carried on without any rigid restrictions as regards grading of the yarns into proper sizes.

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(*ii*) The expert trade is entirely dependent on proper grading. For the development of the export trade the establishment of a Silk Conditioning House in Calcutta will create confidence in foreign markets.

QUESTION 22.—(*a*) (*i*) The Government departments may help the co-operative movement by propaganda work and demonstration of improved methods.

(*ii*) Educated non-official agencies may start societies including a certain percentage of illiterate members and if they work with a real desire to do good to these backward classes, they can help a great deal towards the movement.

(*d*) Speaking of the silk societies, I am of opinion that these societies have been of great help towards the improvement of the condition of the members. Through the efforts of the sericultural officers many proposals for such societies were sanctioned by the Registrar of Co-operative Societies. At present, the Sericultural Department is concerned only with the submission of the proposal for the silk societies. If the sericultural officers were associated with the supervision and working of these societies much more improvement could be introduced than is possible under the present arrangement.

Oral Evidence

19347. *The Chairman:* Mr. Chaudhuri, you are Deputy Director of Sericulture in the Presidency of Bengal?—Yes.

19348. You have put in a very interesting and complete note on this important topic and I have very few questions to ask you. Do you wish to say anything to supplement what you have written, before I proceed further or shall I begin to examine you at once? —My difficulty is that the Questionnaire deals mostly with agricultural matters, and I had to answer those questions with reference to sericulture.

19349. I think you did it very aptly if I may say so. I do want to get from you, if I can, your estimate of what sericulture is capable of bringing in as net revenue, or as gross revenue, whichever way you like to give it, per acre to the sericulturist. Have you got those figures?—Yes. I have the figures for representative villages of the rearing districts.

19350. Let me ask you one or two preliminary questions first. In this Presidency, is the land on which the food plant is grown irrigated?—As regards mulberry there is seldom irrigation; those lands which have no facilities for irrigation are especially taken for mulberry growing.

19351. Is any mulberry grown on irrigated land?—Very seldom. The rearers here use for mulberry growing those lands they cannot cultivate for agricultural purposes.

19352. Is not the ordinary rainfall amply sufficient for mulberry in the silk-growing districts?—No, irrigation will improve it; but the rearers have so arranged their crops that they do not suffer much in that respect.

19353. You mean they have so arranged their other crops?—No, we have crops four or five times a year, and so it is continuous all through the year, unlike Europe where they have only one crop.

19354. I do not understand how that arrangement makes the cultivator less dependent upon the season?—As regards the mulberry production I think they are less dependent upon the season, whereas with regard to worms they are very much dependent upon the season. It so happens that at the time when they have the largest outturn of mulberry leaves the worms suffer most from diseases; that is the time when the worms will do very badly.

19355. So that matters even themselves out and it is the case that over any ten years the cultivator is more or less independent of the season; is that the position?—Yes.

19356. I am not sure I have understood your point?—My point is this, that with regard to mulberry cultivation the rearers of course arrange their crop in such a way that when they get most mulberry leaves they rear. They get from the same plant five crops a year. From the same unit of leaf consumed, the silkworms are seen to yield more silk in March-April than in July when there is more rainfall and the yield of leaves is greater.

19357. *Rai Bahadur Bannerji:* What is the custom when a cultivator commences growing mulberry? He gets the cuttings and puts them in his field, say, in the month of July?— He plants the cuttings in September.

19358. Now this plant which is put in the field in the month of September grows to the stage when it will admit of the leaves being cut by the month of December?—The first pruning will be in 6 months.

19359. Do they get only one cutting out of it then?—Yes, there are five crops. If the first crop is in March the second crop will be in May-June, and the third crop in July.

19360. *The Chairman:* What happens in a bad year when the rains fail?—The leaves turn yellow, and have to be rejected.

19361. Now, can you give us these estimates of profits per acre?—I have taken one village in Malda where there are 32 rearers on a total area of about 133 bighas; the net income per acre is Rs. 200.

19362. Is that dry land?—Dry land.

19363. It is interesting to notice that that is precisely the same figure as that which we got in Mysore from the expert in that State, except that in that case it was an estimate of the money yield per acre on dry land as a part-time industry. Is this a part-time industry or not?—It is difficult to say; it is practically part-time, because when they feed the worms they have not got to do other work.

19364. Can you give an estimate of the difference in net profit per acre between this industry carried on as a whole-time industry and the same industry carried on as a part-time industry ?—I think as regards the Malda figure, that can be taken as a part-time figure.

19365. You do not think it makes much difference ?—No.

19366. They get the full amount of crops ?—Yes.

19367. When you are talking about net profit, are you subtracting from the total gross profits an allowance for the cultivator's own labour ?—I have deducted the cost of manure, the cost of cultivation, the price of leaves (sometimes they have to purchase leaves), the price of seeds and the rent of land; the rent of land is usually about Rs. 15 per acre here.

19368. You have deducted nothing for the cultivator's own labour ?—That comes under the cost of cultivation.

19369. The labour charges are included under cultivation, are they ?—Yes.

19370. The whole of the labour charges ?—Yes, except the feeding of the worms; that we could not calculate, because all the members of the family join in and feed the worms early in the morning at 3 o'clock, and then once again at 1 o'clock in the afternoon and again at 9 o'clock at night. That does not come in the daily labour; that is the only thing that we have not calculated.

19371. Is the practice here to do a certain amount of reeling in the cultivator's house ?—There are many cases like that. In fact, that is the way in which the industry is carried on at present. We made a survey in 1922 and we found steam filatures had got 2,000 working basins, that is on a factory basis. The cottage working basins numbered 5,000.

19372. Then have you organisations dealing purely with reeling ?—No.

19373. Have you commercial concerns doing reeling only ?—Yes. They purchase cocoons from the rearers and reel them.

19374. They do not weave ?—No; they sell it as raw silk.

19375. Have you many co-operative societies conducting sericulture ?—We have got about 52 co-operative societies.

19376. How do they do ? Are you satisfied with them ?—There is no doubt that the members of these societies have been greatly benefited by this movement. We are not directly concerned. We submit a proposal and the Registrar of Co-operative Societies sanctions it.

19377. The Co-operative Department sanctions it ?—Yes.

19378. Does your department keep in touch with the Co-operative Department ?—Of course, we are helping by propaganda. We do not keep in touch exactly because the audit and other things and the work of the societies are entirely under the control of the Registrar of Co-operative Societies.

19379. Do you think you know enough about these co-operative experiments to tell the Commission anything about them, or would you rather not ?—My experience so far as silk societies are concerned leads me to think that our department should be associated with the work of the Co-operative Department. At present we merely submit proposals. It is technical work and I doubt whether the co-operative people will always be able to keep a proper watch over them. Our people have to go to these places and I think our staff should be the supervising officers of the co-operative silk societies also.

19380. In the meantime are the co-operative societies providing any technical advice apart from your department ?—No, not much.

19381. None ?—Not much.

19382. A certain amount ?—Very little with regard to demonstration of improved methods. In Malda, there is a proposal to start a silk union as a federation; the Collector of Malda and the Registrar of Co-operative Societies have taken up the question.

19383. Is it your opinion that this industry is capable of being extended to any important extent in the Presidency ?—I think so; but the extension in new areas practically entails supervision by the Government department entirely. In new areas where there is no sericulture Government will have to do the marketing of the produce.

19384. There will be no marketing organisation ?—No.

19385. How about the competition from artificial silks ? Is that a very important consideration ?—I do not think artificial silk is competing much with our silk.

19386. You do not worry much about it ?—No.

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19387. How do you account for the fact that it is not competing ?—Because we have not got much export trade. Our silk is mostly taken up by the other Provinces.

19388. But is there not a large and growing quantity of artificial silk being imported into and sold in India ?—It might have had some effect on the fall in the prices of silk.

19389. There is nothing more you want to say on that point ?—No. I heard that in Nagpur they tried artificial silk but the weavers did not take it up.

19390. Have you any silkworms domesticated in this Presidency feeding on any plant other than mulberry ?—Yes, on castor leaves to a very small extent; but it is mostly in Assam.

19391. Do they do well on them ?—Yes.

19392. *Rai Bahadur Bannerji :* You said that irrigation was not wanted for these plants; but I have seen in certain parts of Birbhum as well as Murshidabad, there are dry seasons in the summer months, April and May, when these cuttings which were put in some months before were actually irrigated ?—It is only in the beginning when a mulberry plantation is newly set up. They seldom do it except in special cases. This may be a special case in Birbhum when the weather is dry they may do it. The total area here in Bengal under mulberry is 25,000 to 30,000 acres and I think we are having 2½ crores worth of silk. In Birbhum and such tracts, there are about 2,000 acres irrigated out of the 30,000 acres.

(The witness withdrew.)

The Commission then adjourned till 9-30 a.m. on Thursday, the 2nd December, 1926.

Thursday, December 2nd, 1926

CALCUTTA

PRESENT :

The MARQUESS OF LINLITHGOW, D.L. (*Chairman*).

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S.
Sir THOMAS MIDDLETON, K.B.E., C.B.
Rai Bahadur Sir GANGA RAM, Kt., C.I.E., M.V.O.
Sir JAMES MACKENNA, Kt., C.I.E., I.C.S.
Mr. H. CALVERT, C.I.E., I.C.S.
Raja Sri KRISHNA CHANDRA GAJAPATI NARAYANA DEO of Parlakimedi.
Professor N. GANGULEE.
Dr. L. K. HYDER.
Mr. B. S. KAMAT.

Mr. J. N. GUPTA, I.C.S., Rai A. C. BANNERJI Bahadur. } (*Co-opted Members*).

Mr. J. A. MADAN, I.C.S., Mr. F. W. H. SMITH. } (*Joint Secretaries*).

Rai J. M. MITRA Bahadur, M.A., Registrar of Co-operative Societies, Bengal

Replies to the Questionnaire

QUESTION 1.—RESEARCH.—(*a*) (*i*) For the proper organisation and administration of agriculture I am of opinion that each Province should have a complete expert scientific staff of its own but that there should be an All-India Research Board to co-ordinate the activities of the various Governments and to prevent overlapping and consequent dissipation of energies and funds. The Research Board should meet periodically and each Province should present before it subjects for research and the Central Board will allocate the subjects to different Provinces which are favourably situated to study them and to produce results from which other Provinces may be benefited. The Board should act as a clearing house for research and should also arrange for research work in conjunction with Universities. Grants should also be made to private individuals to carry researches on their own farms.

It is very desirable that a proper research should be made into the scientific value of the indigenous theory and traditional methods of agriculture. Even superstitions connected with agriculture have a scientific value of their own. This is particularly true in the case of sericulture where behind a series of superstitions with regard to cocoon-rearing are concealed scientific truths of very high order.

(*ii*) The All-India Research Board should also co-ordinate veterinary research in the same manner as has been suggested for agricultural research.

As regards financing, I am of opinion that agricultural research is a matter of such vast importance to this country that Government should allot funds from its revenue. If, however, such a course is not practicable, I suggest that a small export duty on goods going out of this country should be levied for research purpose and the proceeds should be earmarked for the object. The levy should be so small as not to affect trade in any way, particularly the interests of the producers.

Government should supplement such levy by means of annual grants but such grants, if not spent within the financial year, should not be allowed to lapse at its close. In this matter the administration of the fund should be modelled on that of the Indian (Medical) Research Association.

(*c*) One of the most urgent needs of the Province is to make proper research into the subject of salt water resisting paddy. I do not think that there has been sufficient research on the subject of potato cultivation. Jute also requires further research, particularly in the matter of evolving a seed, which will produce fibres that will suit both Dundee and the Calcutta mills. Water-hyacinth is another subject which requires research not only with a view to discovering how it can be eradicated but also to explore

its possibilities as manure and as fodder. There should also be a proper soil survey which is long overdue in Bengal.

I am further of opinion that a committee of medical experts should be appointed to determine a standard of diet to keep individuals in a minimum state of efficiency. There is a general impression that in many parts of the country agriculture suffers from a lack of proper diet on the part of those engaged in the pursuit.

QUESTION 2.—AGRICULTURAL EDUCATION.—(*v*) The main incentive to lads to seek agricultural education is Government service.

(*viii*) I am not in favour of school plots in connection with primary schools but such plots and farms may be attached to middle and high schools in rural tracts. Nature study should be insisted on as a means of giving agricultural bias to rural education.

(*x*) Agriculture can certainly be made attractive to middle class youths if it can be shown that it would pay them to take to it. But I do not like to lay too much stress on interesting middle class youths in agriculture as a solution to middle class unemployment. As I said in a speech at a Co-operative Conference, there is not enough land to go round all the unemployed middle class youths and the density of population compels rural Bengal to leave the land and move to cities or to migrate to other Provinces in order to earn a living.

(*xii*) Adult education may be popularised by means of night schools. In this connection I would mention that some of our co-operative night schools have been very successful. Magic lanterns and cinema lectures are likely to play a useful part in popularising adult education.

(*xiii*) Administration of such schools as may be started should be in the hands of local bodies and the managing committees should include representatives from rural areas. It seems to me a mistake to insist upon the provision of good buildings for schools in rural tracts. I think that such funds as may be available should be more profitably employed than in putting up good-looking buildings. Some sort of school-houses may always be found in villages. In any case our students from time immemorial are accustomed to take lessons from their *gurus* under the shade of a tree.

I have a scheme under consideration to open primary schools in well-developed co-operative areas, which will be financed out of the profits made by co-operative societies in the areas. The *gurus* in charge of these schools will be required to open night classes for adults and to assist secretaries of village societies in writing out their accounts.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(*a*) Demonstration of actual results before their eyes.

(*b*) To increase the real effectiveness of field demonstrations, it is necessary to induce cultivators themselves to undertake experiments on their own fields and for this purpose demonstrators should be allowed to advance improved seeds and manures on condition that the cost is paid after the harvest, if experiments prove successful. The use of improved implements should be allowed on easy terms. Such demonstrations on the fields should be carried on in the interior of the district and as near to *hats* as possible.

(*c*) Periodical lectures will be of the greatest use towards the adoption of expert advice. On the qualifications of the lecturers, on their power to approach the masses, will depend the success of these lectures. A good method of inducing cultivators to approach them is through their co-operative societies in which they have entire confidence.

Considerable success has been achieved in jute seeds, *kakia bombai* and *Chinsura green*; paddy seeds, *kataktara* and *indrasail*; and *tanna* sugarcane, and potato, Nainital and Darjeeling varieties. The success is primarily due to the efficacy of these seeds though in the case of *tanna* cuttings there is a feeling that the outturn of *gur* is not very satisfactory. As regards *kakia bombai* jute, it is liked by the Calcutta mills but not by the Dundee mills and a feeling has arisen that it takes too long to mature, that the ryots are unable to cut it and utilise the land for paddy. Ryots like short crops. In many areas, on account of the failure to supply seeds at proper time, people have not taken to them and have lost confidence. But in this matter, there has been considerable improvement during the last two or three years.

QUESTION 4.—ADMINISTRATION.—(*a*) I have already made suggestion, regarding this in reply to question under Research.

It is very necessary that each Province should have a complete scientific staff of its own though it is desirable that there should be an agency to co-ordinate their activities.

(*c*) (*i*) These services are under-staffed and therefore they are not in a position to be serviceable and efficient.

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(*ii*) The ryots have not derived any benefits from the rivalry between steamer companies and railways. The steamer companies so long as they are able to supply space against the interest of railways invariably do so. When combined service comes into effect charges or freights are always increased because these are arranged jointly between the two. In Northern Bengal, as there are no steamer companies the railways realise that all jute must be sent down through them. In consequence at a certain period when Eastern Bengal shipments are large the railway companies to obtain their share of profits and to compete favourably with steamer companies divert a large portion of their wagons to the Eastern Bengal system and in consequence Northern Bengal suffers. About that time big baling firms who have sufficient command of capital often purchase jute at ridiculously low rates and stock them for transport when wagons become available.

I believe there are instances when the Railway Board have insisted on steamer companies raising their rates in order that the railways might get a portion of the traffic. The railway service—I refer more specifically to Eastern Bengal, such as Dacca, Mymensingh, Juggannathganj, Bahadurabad and also Western and Northern Bengal—is not very successful in the booking of goods traffic to Calcutta. Their present system of registration is by no means a success and can generally be evaded or infringed by questionable methods. There is far too much red tape in the railway administration with the result that members of the staff entrench themselves behind these regulations and hinder rather than assist the consignor.

It is desirable that small feeder lines, both railway and steamer, should be opened to help cultivators to market their produce. But in cases where feeder lines are not a financial success, Government assistance might be of great help for the first few years.

Unfortunately road services are very ineffective and there is ample scope for more roads. In late years owing to paucity of funds and the claims of other objects on available funds roads have been greatly neglected. The recent heavy influx of motor cars and busses on roads never intended for this class of traffic has only tended to make matters worse.

(*iv*) *Meteorological Department.*

The Department is too much centralised and there should be a wider diffusion of warnings than at present.

(*v*) *Posts and* (*vi*) *Telegraphs.*

Post and Telegraph Offices ought to be more efficient. With code telegrams the percentage of mutilated telegrams is too high.

QUESTION 5.—FINANCE.—(*a*) I think the only satisfactory way of financing agricultural operations is by the wider extension of the co-operative credit movement. Credit societies should be linked to Central Banks which should in their turn be linked to the money market through their Provincial or Apex Bank. Co-operative societies are in an excellent position to cater for short-term and intermediate loans, while for long-term loans there should be land mortgage banks, preferably on co-operative basis.

(*b*) I do not think it is desirable to make fuller use of the Government system of *taccavi* which is seldom resorted to in this Province except in years of agricultural scarcity.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(*i*) *The main causes of borrowing are*—(1) agricultural needs, (2) insufficient production, (3) social ceremonies and (4) litigation to which most people resort for lack of amenities of village life.

Fluctuations in the price of jute are also a very serious cause of agricultural indebtedness in Bengal. When there is a rise in the price of jute, the standard of living goes up and the jute growers are badly hit in a year when the price goes down. The speculative element which is so strong in the case of jute makes the cultivators rather extravagant and tends to lower their moral fibre.

(*ii*) *Sources of credit.*—Local moneylenders, loan offices which are joint stock concerns engaged in receiving deposits and loaning out on mortgages, and co-operative societies.

Some of the merchants are also moneylenders and they take unfair advantage to buy produce at a very cheap rate from the agriculturists. One of their tricks is to give necessaries of life on credit and thus to bring the cultivators more under their control.

(*iii*) *Reasons preventing repayment.*—The same causes which lead to borrowing often operate against repayment in time. The high rate of interest in the case of moneylenders is also another reason. The anxiety of moneylenders not to press for repayment so that their money may earn interest and a tendency to let interest swell and fabrication of accounts also stand in the way of repayment.

(*b*) I do not advocate special measures to deal with rural insolvency. Nor would I enforce the application of the Usurious Loans Act. I think the spread of the co-operative

movement and the establishment of land mortgage banks on co-operative basis will in due course lighten the agriculturist's burden of debt.

(*c*) I do not advocate any measures to restrict or control the credit of cultivators such as limiting the right of mortgage and sale, but I would place restrictions on non-terminable mortgages.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—(*a*), (*b*) and (*c*) In Bengal the question is not so important as in other Provinces as the Bengal ryots live very near their lands. At the same time there cannot be any doubt that excessive sub-division of holdings is a source of loss in agricultural efficiency. The question has recently been studied by Mr. McLean, Deputy Director of Agriculture, and Rai Sahib N. C. Bose, Assistant Registrar of Co-operative Societies, Burdwan Division. One of the serious obstacles in Bengal is the system of land tenure. There are other difficulties too, such as, the extreme reluctance of the people to give up their ancestral holdings. But an experiment should be made to enable us to see whether any of these difficulties would make the consolidation of holdings an impossible proposition. Government have therefore sanctioned a special Inspector of Co-operative Societies to enable this department to make an attempt to start co-operative societies for the purpose. It would be an advantage if the experiment of consolidation of holdings be attempted at the time of survey and settlement operations with such special legislation as may be necessary. It is proposed to try the first experiment in Government *khas mahals*.

QUESTION 8.—IRRIGATION.—(*a*) (*i*) Irrigation proper is sadly neglected in Bengal. The problems with which the Irrigation Department is mainly occupied are the improvement of navigation and of sanitary conditions and the control of flood water. There is a great need for the adoption of new irrigation schemes by means of perennial and non-perennial canals in the districts of Bankura, Midnapore, Birbhum, Hooghly, Burdwan, Malda, Dinajpur and Rajshahi.

(*ii*) There is also considerable scope for irrigation by means of tanks and *bunds* in Bankura, Birbhum, Midnapore, Hooghly and Burdwan. As a matter of fact these were a very useful means of irrigation in old times, but owing to sub-division of interests in the lands, these tanks have been neglected and allowed to fall into decay and become unfit for the purpose for which they were originally intended. In the case of minor stream schemes where there is a cohesion among persons to be benefited, as also in the case of tank and well schemes, there is a great scope for co-operative irrigation work. In fact, considerable progress has been made in this direction in Western Bengal. The first co-operative society was started in the year 1916 at Khelar in the district of Midnapore and societies of this class have since been formed in the districts of Bankura and Birbhum.

These irrigation schemes fall under the following heads :—

(1) Excavation and re-excavation of tanks.

(2) Erection of irrigation embankments for the storage of water flowing down higher levels.

(3) Construction of masonry weirs across small perennial streams and conserving water for irrigation purpose.

Very great progress has been made under heads (1) and (2). Progress has been retarded under head (3) owing to the failure of the Irrigation Department to provide proper plans and the delay in execution of the weir schemes taken up.

(*iii*) Wells. There is scope for well irrigation in the districts round about Calcutta for the cultivation of potato and also in some districts in Northern Bengal.

(*b*) Though I have not much experience on the subject, I think that the present system of distribution of canal water is susceptible of improvement. I doubt whether temporary outlet leads to economical and equitable distribution of canal water. Sufficient care should be taken to see that just the requisite quantity of water is allowed along the distributary channels to the cultivators. Cultivators paying irrigation cess should be compelled to maintain *ails* sufficiently high to contain enough water to avoid frequent irrigation and wastage of water. Tanks of suitable dimensions with high embankments should be excavated at the tail end of distributary channels and of branch canals to prevent wastage of water by overflow which does great damage to the crops and creates much inconvenience to the cultivators at the time of harvesting.

QUESTION 9.—SOILS.—(*a*) In parts of Khulna and the 24-Parganas districts, the land is still below the high water level and as a result embankments are necessary to prevent the ingress of salt-water which is inimical to the growth of crops. But the zamindars on whom this duty has been sometimes placed in the temporarily settled estates and in the Sunderbans lots often neglect their duty and in other areas where the duty has been

placed on the tenants they are unable to combine for the purpose. The landlords also offer considerable opposition to any attempt at such combination. Recently, it has been possible to organise one embankment society for the purpose of putting up an embankment for an area of 1,200 *bighas* in Bhil Durbadanga in Kaligunj Police Station of Khulna district. If this society proves a success, it would greatly assist in the formation of similar societies in the locality.

The policy of making effective embankments to prevent the ingress of salt-water is not approved of by several irrigation authorities, the idea being that the prevention of ingress of flood water causes silt to be deposited in the streams which result in the bed of rivers being raised. The question therefore requires investigation.

The problem of drainage in the Burdwan Division has special features of its own. The Division is intersected by a number of rivers which have their sources in Chota Nagpur plateau and which have to discharge a large volume of storm water after comparatively short courses. This makes the Division peculiarly liable to floods. Erection of extensive river embankments will in many places lead in the end to unsatisfactory results, though it would afford temporary immunity from floods. It prevents the enrichment of soils by deposit of silt from flood. Large areas which used to be enriched and benefited by such silt discharge are now dry waste lands. There are also many areas now in the Division in which embankment schemes are pending execution. It seems that a better solution of the whole problem would be by constructing reservoirs in the higher reaches of Damodar and Barakar rivers. The scheme will not only serve the purpose of ensuring the safety of the embankments which are in existence or may be erected, but will also ensure the constant supply of water from canals which may be taken off from the Damodar. In the Presidency Division, owing to the silting of small rivers there has been a great agricultural deterioration especially in Jessore, Nadia and parts of Khulna. The control of the entire river system in the Presidency Division is one which should be seriously taken up. What is needed is a comprehensive irrigation policy in Western Bengal not only to prevent agricultural deterioration but also to improve sanitary condition of the area. In many low-lying tracts in Eastern Bengal improvement of soil by flooding and flushing is possible and there should be a comprehensive survey.

Erosion is especially noticeable in Bankura, Birbhum and Midnapore. Afforestation in these districts might possibly help in preventing erosion.

QUESTION 10.—FERTILISERS.—(*a*) I think there is undoubtedly scope for more profitable use of natural manure and artificial fertilisers. Bonemeal and sulphate of ammonia can be profitably used in Bengal. Unfortunately the high price of bonemeal due to export to Java and other foreign countries stands in the way of extensive use of bonemeal. I think that the export of bonemeal should be stopped. Tank silt may also be profitably utilised as manures.

(*b*) I do not see how fraudulent adulteration can be prevented except by legislation. But if ryots obtain their supply through co-operative supply societies these organisations might arrange for testing the supply before distribution.

(*c*) By demonstration.

(*d*) Oil-cakes are now extensively used in potato growing tracts; sulphate of ammonia is used in the Natore and Naogaon sub-divisions of the Rajshahi district.

(*e*) I do not think that sufficient investigation has been made. I think that bonemeal was tried in many places though it has now come into disuse in circumstances already indicated.

(*f*) It is very difficult to discourage the use of cowdung as fuel unless some other suitable and cheap fuel is substituted.

QUESTION 11.—CROPS.—(*a*) (*i*) I have already suggested that special steps should be taken to evolve a variety of jute, the fibre of which will be acceptable both to Dundee and Calcutta mills and which will take less time to mature than the *kakya bombai* variety.

(*ii*) As far as possible seed distribution should be done by private agencies. An attempt should be made to develop seed industry through agricultural co-operative sale and supply societies.

(*iii*) I think there ought to be liberal rules for the grant of gun licenses to cultivators. In some areas wild animals cause a great havoc to crops. I have come across suggestions at Chittagong that the Forest Department have stringent rules operating against the destruction of wild animals and consequently cultivators are at a great disadvantage. Monkeys are a source of very great trouble in certain areas in some of which there is a feeling even among Hindus not to offer any resistance to anybody who undertakes to kill monkeys.

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QUESTION 14.—IMPLEMENTS.—(*a*) I have no suggestions to offer. I think that the existing machinery has not yet been improved upon. In connection with the introduction of agricultural implements, particularly ploughs, one thing should be borne in mind, namely, that in most parts of the Province land is easily tilled and that cattle are very weak.

(*b*) If it can be demonstrated to cultivators that improved implements will pay, the cultivators will undoubtedly adopt them and will even borrow money to get them. In fact, through their co-operative credit societies they can obtain loans and through co-operative sale and supply societies they can obtain implements. The question is whether we are in a position to recommend such implements. Another important thing is that the implements should be such as can easily be repaired in villages unless the supplying firms are in a position to establish agencies for the purpose in different rural centres.

(*c*) Foreign manufacturers ought to be able to obtain agents who understand the peculiar circumstances of this country and who would be in a position to utilise the agency of the existing co-operative societies for the distribution of their implements.

QUESTION 15.—VETERINARY.—(*a*) Although, theoretically, it would seem desirable that the Veterinary Department should be under the Department of Agriculture, the former has, as a result of experience, been given the status of an independent department. I think the existing arrangement might continue, there being close co-ordination between the two departments.

(*b*) (*i*) Yes. I have no direct personal experience.

(*ii*) No.

(*iii*) No, I would not go so far, though I would take special powers for provincial department to interfere in cases of clear necessity. Also Government might give some sort of subvention to local bodies with a view to encouraging multiplication in the number of dispensaries.

(*c*) (*i*) No. No improvement in this direction can take place unless more dispensaries have been established and veterinary assistants should also investigate the possibility of using indigenous medicines.

(*ii*) No. Not to a great extent.

(*d*) The obstacles are the disinclination of villagers to adopt such advice as might be given to them and which the Veterinary Department have at present no power to enforce. I think legislation in the direction suggested will alone enable effective action being taken.

If such legislation is followed up by the formation of cattle insurance societies with strong Government backing and if Government provide for the payment of compensation for the first few years for loss of cattle through epidemic diseases in cases where proper precautions have been taken such legislation will not be unpopular.

(*e*) I am not aware of any.

(*f*) The main obstacle is that cultivators have yet to be convinced about the efficacy of inoculation. A fee is also charged and this also acts as a deterrent.

QUESTION 16.—ANIMAL HUSBANDRY.—(*a*) (*i*), (*ii*) and (*iii*) Cattle in this Province are perhaps the worst in any country and are least cared for. This is probably due, in part at least, to the fact that the soil over the greater part of Bengal is easily tilled and does not require a strong breed of cattle for the purpose, but it cannot be doubted that it is responsible mainly for the present paucity of milk-supply. The question of the improvement of cattle is closely connected with the betterment of the dairying industry. The dairying industry must be improved and developed and by securing larger outturn of dairy produce and better return for it, it must be proved to the cultivator that proper cow keeping is a paying proposition before he will interest himself in the matter. Experience suggests that this can perhaps best be effected through co-operative organisations. An instance in point is the co-operative milk societies round about Calcutta which are federated into the Milk Union in Calcutta. These organisations have been successful in inducing cattle owners to take a keen interest in their cattle and to accept readily advice for improvement of cattle by better breeding, better feeding, and better keeping. These organisations maintain pedigree stud bulls at different centres and have taken up the growth of fodder crops by way of demonstration. Already there has been improvement in the condition and class of cattle of these societies and an increase in the outturn of milk. A multiplication of these societies and their extension to other areas would secure a great improvement in methods of animal husbandry. In areas where there is not much demand for whole milk the possibility of starting factories for milk products should be investigated.

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(*b*) (*i*) Overstocking of such common pastures as still exist and have not been encroached upon for the purpose of cultivation is the rule in this Province with the result that grazing is poor both in quantity and quality.

(*ii*) There are doubtless small grass borders known as *ails* between tilled fields but these show a continued tendency to shrink and are not always available as pastures. The quality of grazing these afford varies with the locality; these generally abound in unpalatable grasses and not in *dhub* grass.

(*iii*) There is generally an insufficiency of such dry fodder, the cultivators being tempted by high prices to sell off their stock.

(*iv*) In some of the districts of the Burdwan Division, there is a scarcity of green fodder in the dry season, January to June. Over the greater part of Bengal, cattle suffer from insufficient grazing from July to November or December when there are crops on the land.

(*c*) *Vide* answer to question *b* (*iv*).

(*d*) By the introduction of fodder crops and by supplementing them by concentrated foodstuffs such as pulses and oil-cakes for feeding cattle. I think that the whole question should be investigated and experiment with silage should also be taken up at potential centres.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(*a*) The number of days done by an average cultivator on his holding during the year depends on the nature of the soil. In areas where only *aman* paddy is grown the cultivators work for six months and very often they are occupied for another one or two months for threshing, etc. Where *aman*, *bhadoi* and *rabi* crops are grown the cultivators are engaged almost throughout the year. As to what an average cultivator does in a slack season it is also difficult to generalise. In Backarganj, he practically sits idle except doing a little boating and making repairs to his house and looking after his homestead lands. In slack season in Tippera, Chittagong and Faridpur, the cultivators migrate to other districts to work as non-agricultural labourers and sometimes to act as petty traders. In the districts of Hooghly, Howrah and Dacca, they take to embroidery. Basket and rope-making are also resorted to in some of the other areas. Poultry-keeping on a small scale is also taken to.

(*b*) Cultivators will take to subsidiary industries if they are educated up to a better standard of living. To stimulate subsidiary industries it will also be necessary to devise arrangements for the supply of raw materials and the marketing of finished products. Jute spinning and weaving will be a very profitable form of industry during the slack season and in some parts of Northern Bengal jute weaving is still very popular with the women-folk of the cultivating classes. Rope-making is another profitable industry which might be introduced. Knitting and lace-making are already in existence to a certain extent. Perhaps one of the most important subsidiary industries which have already been introduced and a wider extension of which should be encouraged is spinning. The simplicity of the spinning wheel (*charka*) which with a little practice can be taken up by any one and which entails practically no physical labour points it out as one of the most suitable subsidiary industries which ought to be widely extended. If the people can grow tree cotton on homestead lands and also as hedge plants, the saving which a cultivator may effect by employing his family members in this way will be considerable.

(*c*) Apart from lack of organisation people here are averse to take to occupations which are not customary in their family. But I think this can be overcome by little propaganda now and provision of proper facilities especially in the way of marketing of produce. The prejudice against taking to pursuits other than those hitherto followed by the community or family is gradually giving way under the stress of economic pressure and demonstration as to the suitability and profitable nature of the industry as also education will gradually complete the process.

(*d*) I think Government should take active step to promote such industries.

A co-operative rice mill is being put up by a co-operative paddy sale society in an exclusively *aman* growing area and it will be watched how far during the slack season which will correspond to the busy season in the rice mills the agriculturists would take to working in the mills.

(*e*) I am not sure how far it is possible to move industrial concerns from their present grouping or location nor how far such industrial concerns should be able to deal with seasonal labour. But I do consider that it is possible to start such industries in connection with the agricultural produce.

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(*f*) I do not think there is any need for intensive study. I think there are sufficient materials already available and the question now mainly resolves itself into the utilisation of such materials as are already available rather than into further investigation.

(*g*) Apart from seasonal unemployment I do not think as a matter of fact there is much rural unemployment.

(*h*) I think by making Union Boards more effective and inducing them to take more interest in sanitation and also by supplementing their activities by the operation of voluntary organisations on co-operative basis.

QUESTION 18.—AGRICULTURAL LABOUR.—(*a*) (*i*) I do not think any special measures are necessary to attract agricultural labour from areas in which there is a surplus to areas under cultivation in which there is a shortage of labour. There is already migration of labour.

Seasonal migration of agricultural labourers is noticed every year in large numbers, particularly from the districts of Noakhali, Chittagong, Tippera and Faridpur, during the transplanting and the harvesting seasons of paddy and jute, to neighbouring islands such as Hatiya, Swandip, Dakhin Shabajpur (Bhola) where *char* lands are constantly being formed, to the new reclaimed areas of Sunderbans. These labourers also cross over to Arakan and Burma proper, where usually a bumper crop is reaped. They get better wages in these places and free lodging and boarding. They practically save almost all what they earn. These are the attractions of the seasonal exodus of agricultural labour to places where area under cultivation is abundant and shortage of labour is experienced. There is also migration of Santhal labour to paddy-growing areas during harvest time.

(*iv*) In areas however in which large tracts of cultivable lands remain uncultivated I think land might be settled on easy terms with *bona fide* cultivators from neighbouring districts in which land is fully cultivated.

(*b*) Except seasonal shortage of labour there is not much shortage of labour in the main land. Sometimes there is an influx of upcountry labour in this Province to deal with an exceptionally large crop. It may also be noted that where agricultural prospects are particularly good, the cultivators are averse to working themselves and prefer employing outside labourers.

(*c*) I think grant of land on suitable terms will be the best means to induce agricultural labourers to migrate to places in which there are large tracts of cultivable waste. The large exodus of the people particularly from the eastern districts of the Province of Bengal to Assam and Cooch Behar during recent years are illustrations of the movement of agricultural labour from congested areas to districts practically undeveloped.

QUESTION 19.—FORESTS.—The forests in Bengal are confined to the hills, Terai, Sunderbans, some parts of Chittagong district and Chittagong Hill tracts. Forest administration does not therefore much affect the everyday life of the people of the Province.

(*b*) One of the best means of adding to the fuel supply of the Province would be to plant unculturable waste in and around the village and to make over the management of these forests to Union Boards or co-operative societies.

QUESTION 20.—MARKETING.—(*a*) The existing markets and distributing centres are determined by the facilities for transport provided by the railways and steamer services and I think there should be extensions of railway lines as well as of feeder steamer service.

(*b*) I do not consider that the existing method of marketing agricultural produce is satisfactory and a separate note on the subject is enclosed (*vide* Appendix).

(*c*) So far as the Indian markets are concerned, I would not advocate any special measures. In regard to jute there is undoubtedly a need for ensuring purity and proper grading, but if the Calcutta mills which are the biggest buyers of jute insist on good packing they are likely to get it. As the trade appears to be satisfied with the existing arrangements, no special steps in the matter seem necessary. As regards export trade, the position is different. I certainly think that where Indian produce is likely to come into competition with produce from other countries, Government certificate about purity and packing will considerably improve the position of the Indian produce in the international market.

(*d*) I think information about market condition ordinarily does not filter down to the cultivators to the same extent as is desirable. Some crop returns, *e.g.*, jute forecasts have been more of a disturbing factor in the market so far as cultivators are concerned. There is a general impression that the cultivators keep themselves acquainted fully with the market of jute but this information is confined to certain localities and to

intermediaries who use them to the disadvantage of the cultivators and also to deceive their agents. I think crop return statistics should be more generally available to cultivators. It is also necessary that returns as to possible demand of the trade for commodities should also be circulated.

QUESTION 22—CO-OPERATION.—(*a*) (*i*) and (*ii*) I think there is ample scope for encouraging the growth of the co-operative movement both by Government and non-official agencies. Non-official agencies should be encouraged by every possible means and particularly co-operative institutions like the Bengal Co-operative Organisation Society should be encouraged to do propaganda and organisation, while Government agency should, in addition to assisting non-official agencies in propaganda work, carry out the statutory duties, see that the societies which are started are not only co-operative in character when established but retain their character, and do statutory inspection and audit. The staff of the Registrar should be adequate to enable him to discharge all these functions. The abolition of the post of the Deputy Registrar and the withdrawal of travelling facilities of superior officers have seriously interfered with the expansion of the activities of the department. Further, there is need for strengthening the staff of the departmental officers and to employ the full audit staff which can be maintained out of the present collections of the audit fees. It is a serious grievance of the societies that although they pay audit fees the full staff of auditors is not maintained. The non-official agencies should also be given increased grants to do their share of the work effectively.

(*b*) (*i*) It is now generally recognised that the only possible extension of credit facilities to the agriculturists is by co-operative credit societies. The credit societies in Bengal have on the whole fulfilled their functions and have been successful in effecting a marked reduction in the prevailing rates of interest. The main defect of the system of agricultural finance through the medium of co-operative societies is its rigidity. Very often members of village societies are unable to obtain loans at the particular moment when they badly require them, especially if at that time societies have no funds. A member wanting a loan urgently will have to apply to his society for it, and the Managing Committee of the society will take some time to deal with the loan application, and by the time the Central Bank sanctions the loan and money is brought to the village for disbursement, the need for borrowing on the part of the applicant may disappear. Another disadvantage of the present system is that loans are very often brought to the village from the Central Bank in a lump sum and distributed immediately to the members. Some of the members may not require loans at that particular time, but all the same, they anticipate their requirements and take their share of the loan. Another defect of the system is that it does not attempt to distinguish properly between loans for crop requirements and loans for other purposes. Loans for such widely divergent purposes as normal crop requirements, which should be repaid at harvest time, and for the liquidation of debts or for land improvements, the repayment of which naturally takes a much longer period, are lumped together in one transaction. The system of long and short-term loans, which corresponds to a real distinction in the needs of members and which would enable the societies to keep an effective watch over the proper use of loans, and their repayment is being pressed upon and is being gradually adopted by the societies. The aim is that the entire requirements of members in respect of short-term loans should be met from cash credit account which should be given by the Central Bank to its societies and which should cover such requirements, the Central Bank in turn receiving similar accommodation from the Bengal Provincial Co-operative Bank. The members of a society should operate by means of cheques against the cash credit account allowed to the society by the Central Bank.

It is hoped that the adoption of the system of allowing cash credits to village societies will remove the inelasticity and the piecemeal character of the present system of agricultural finance through the medium of co-operative societies.

(*ii*) All the agricultural purchase societies are doing useful work, but my own experience is that these societies in order to be more useful should handle large quantities.

(*iii*) Societies for the sale of produce have been very successful but they are limited in number. This year, however, a wide extension of the sale movement has taken place. An excellent beginning has been made in the co-operative sale of jute. The jute sale societies have within a very short time been successful in establishing a good reputation in the Calcutta market and their packing fetches the same price as European packing.

What the co-operative movement aims at is to develop a really complete sale and supply organisation on a national scale. Our aim is to have a net-work of sale and supply societies and to link them into a wholesale society with headquarters in Calcutta. The wholesale society will work on a departmental basis, each department dealing with the commodity it is entrusted with. Such a federation will not require an enormous capital, it can work largely on *contra* accounts and its trading capital may be used by each department when it requires.

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(*iv*) Irrigation societies for the construction of *bunds*, tanks, etc., have been highly successful in Bengal. These societies are a special feature of co-operative work in Bengal. They are largely appreciated though their organisation takes a little time as it is necessary to bring into the scheme all persons interested in it and there is no legal means to compel a small minority who refuses to come into it. For the success of these societies it is very necessary that proper engineering advice should be available to them and that Government should for some time to come provide such engineering advice free of charge but in a manner not calculated to make Government in any way responsible if their advice is not properly followed.

(*v*) No such society has yet been started in the Province but the question is being investigated.

(*vi*) One of the sale societies has invested some money in pumping machines and they are highly appreciated as it has effected a saving in irrigation charges. The difficulty is that the local *mistries* are unable to repair such machines. The sale society has now employed three apprentices to learn the repair work in Calcutta under the firms who supply these machines. The great difficulty in forming such societies is that there are very few improved agricultural implements which can be profitably used by the agriculturists. If we are in a position to recommend such implements, there will be no difficulty in their getting a supply of them through the agency of sale and supply societies. This will in fact be a branch of the supply work.

(*vii*) We have a few very small societies for joint farming. They can hardly be regarded as societies for joint farming but they are really formed for inducing the members to take leases of lands to reproduce seeds supplied by the Agricultural Department. Only one of the societies is doing good work. In it all the farming is done by the sons of the members who are pupils in a local school.

(*viii*) We have no such societies in this Province.

(*ix*) Anti-malarial and public health societies come under this class. They have been very successful in stimulating interest in sanitation and in improving health conditions of rural areas. What is wanted is that these societies should have an economic basis and that there should be some arrangement to secure continuity of interest on the part of all concerned.

(*c*) I think it is very necessary that legislation should be undertaken to compel persons to join for the common benefit of all, but that they should not be compelled to join as members of co-operative associations against their wishes. Nor should co-operative associations be compelled to take any one and give them equal rights and privileges. But powers should be given to co-operative societies to apply to Collectors to compel persons who may derive any benefit from the operations of the society to contribute to the funds of the society and to continue to enjoy such benefits.

(*d*) On the whole societies have achieved their objects.

QUESTION 23.—GENERAL EDUCATION.—(*a*) Agricultural bias should be given to the system of education throughout all the courses.

(*b*) (*i*) This can only be done by correlating their education to their natural surroundings and giving it a distinctly agricultural bias as has already been suggested.

(*ii*) There is no compulsory education in rural areas.

(*iii*) Because their parents generally take them away from schools to help them in agricultural work as soon as they grow up. Sometimes also the parents cannot afford to pay school fees.

QUESTION 24.—ATTRACTING CAPITAL.—(*a*) This can only be done by demonstrating that farming is a paying proposition. But at the same time I deprecate the introduction of large scale farming which can only end in expropriating a large number of men having small holdings, as the amount of culturable waste is very small.

(*b*) To a certain extent the system of land tenure and the Bengal Tenancy Act is responsible and in many cases a number of persons having interest in land are so numerous that any combined action by them in this direction is not possible.

QUESTION 25.—WELFARE OF RURAL POPULATION.—(*a*) Pure water-supply is one of the urgent needs of rural areas.

(*b*) I am in favour of conducting economic surveys in typical villages with a view to ascertaining the economic position of the cultivators, but I am not in favour of Government conducting such enquiries. These enquiries should be conducted by economic societies and by mixed boards specially constituted for the purpose, which should be liberally subsidised by Government.

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APPENDIX

Note on marketing of agricultural produce

It is difficult to make any general remarks with regard to marketing of agricultural produce. Conditions vary with regard to different crops, and even in the case of the same crop, marketing is carried on under different conditions in different localities. The middlemen play a very important part in the business. There are different grades of middlemen in the case of different crops, the number of middlemen varying according to the nature of crops. In the case of commercial crops the number of middlemen is larger than in the case of ordinary food crops. There are the village *farias*, who collect the produce and sell it to *beparis*, who take it to *arath*, where it is sold through either the *arathdars* or brokers. Then it is exported to the principal distributing centres for sale very often to another set of middlemen, through whom the consumer ultimately gets his supply. Very often cultivators obtain *dadans* from the middlemen and sell their produce to them at unfavourable rates.

2. I shall now deal with some of the crops about which I possess some information.

Paddy.—Paddy is often collected by *beparis* or *paikars*, who move about in the villages at harvest time collecting the crop from the houses of individual cultivators and also from local marts. The *beparis* sometimes purchase paddy on their own account and sometimes as commission agents of merchants who finance them and take the paddy either to Calcutta or to other important selling centres. The *beparis* who carry their paddy to Calcutta cannot sell it to the mills direct, but have to do so through *araths* or godowns. The proprietors of godowns or the *arathdars* sell the paddy either to the shipper for export or to the mills which convert it into rice. The *beparis* are absolutely at the mercy of *arathdars* in the matter of the disposal of their produce. The *arathdars* levy not only their usual charges, but also a commission for the sale of paddy, it being stipulated that the sale has to be effected through them. The *arathdar* very often gives false accounts of transactions to the purchaser and also cheats the *beparis* in respect of these. Occasionally the *arathdar* purchases crop and sells it on his own account, and he often does it when he is certain that there would be a rise in the price. In Backarganj district the system is somewhat different. Here the major portion of the paddy is exported after being husked, while a very small portion of it is taken away by boats and sent to some of the Eastern Bengal districts. With regard to the rice that is exported, the system that prevails there is that the small *beparis* in boats go from door to door or to *hâts*, and there they purchase the paddy which is carried by them to the big centres of rice trade, such as Angaria, Boga, Chamta, Neamati and Jhalakati. The huskers at those places purchase the paddy in one *hât* and sell the husked paddy at the next *hât*. The rice is then purchased by traders who either stock it or export it to Calcutta according to the demand. In many places where paddy is not stored in *arath*, it is sold to local *dalals*, who are generally paid Rs. 3 as *dalali* or commission per 100 maunds sold. Very often paddy dealers advance money on condition that the principal and interest are repaid in kind. The rate of interest charged on these transactions is generally very high and the value of paddy in such circumstances has no relation to the market price.

Jute.—The number and variety of middlemen is larger in the case of jute than in the case of other crops. This might be due to two reasons—either to the high value of the crop which requires larger funds for its movement, and hence a larger number of middlemen to finance or to the special processes of baling which have given rise to a special class of middlemen, *viz.*, the baler and his agent. The number of intermediary agents who handle the jute is about five. The number of course varies with the nature of communications between the village and the mill. There is also a subsidiary class of *beparis* generally known as *paikars* in Northern Bengal and as *farias* in Eastern Bengal, The *bepari* is a local dealer who is sometimes, but by no means always, a moneylender. He buys direct from the cultivators either at the latter's house or at a village market. Between the baler and the *bepari* there is often the *arathdar* or the broker who is commonly known as *dalal*. The *arathdar* is very often not the owner of the jute which passes through his hands, but he charges a percentage from the *beparis* who make use of his *arath* or warehouse for depositing their jute before selling it to the baler's agent. The baler's agent is a paid servant of the baler, and does not become the owner of the jute which he buys, but as his salary is not fixed on the principle that it represents the whole of his remuneration, he is in a sense another intermediary between the cultivator and the baler. Various tolls are levied on the producers by middlemen. Dryage allowance known as *dhalta* is often deducted in calculating the weight of jute sold. Various other charges are levied also by baler's agents, such as *mutti, kabari* (staff allowance), *mutti baset, birti or newaj*. A baler makes great profit in the manipulation of the scales by *koyal* or weighman which means a good sum extracted from the original producer and which

swells the profits of the baler. On the variations of the local weights, balers often make large profits. For instance, the local weight at Chandpur in 83 *sicca*. It has been calculated that on 100 maunds of jute of 80 *sicca* weight the baler would get 20 seers of jute extra.

Tobacco.—Every tobacco growing village abounds with *paikars* and *dealers*. *Dalals* have big godowns of their own. Agents or merchants from Chittagong, Akyab and Rangoon and also Marwaris flock to tobacco-growing areas in the season and purchase tobacco through *dalals* in whose house they put up. These *dalals* again procure stocks through *paikars* and also direct from growers. *Paikars* sometimes advance money even at seedling time and enter into contracts with the growers for the purchase of their crop at very low rates. The most important centres for local distribution are Manikganj in the district of Dacca and Hajiganj in the district of Tippera. In Hajiganj, the merchants seem to make great profit on the difference of local weights. In Jalpaiguri, the local weight is 93 *sicca*, but the weight of Hajiganj tobacco is only 80. Manikganj is a bigger centre than Hajiganj, and sometimes Hajiganj traders get their supply from Manikganj. The following figures give an idea of the volume of export trade in tobacco leaf from Chittagong port :—

		lbs.	Rs.
1925-26	Burma	1,678,092	4,43,118
1924-25	„	2,416,479	6,79,588
1923-24	„	2,398,918	6,54,906

Cardamom.—Cardamom is grown in Darjeeling and the trade is entirely in the hands of Marwaris. They give advances on a very extensive scale, and they manage to get the cultivators to sell their produce to them. Last year, although the price of cardamom varied from Rs. 60 to Rs. 95, I found on enquiry that the cultivators on an average did not get more than Rs. 30 per maund. I have even come across instances in which cultivators sold their cardamom at Rs. 12 per maund against advances received by them.

Turmeric.—Turmeric is another crop which is largely financed on the *dadan* system. Raw turmeric is purchased by local *mahajans* from the cultivators to whom *dadans* are made before. The *mahajans* fix the price at the time of giving advances. The *mahajans* sell dried turmeric direct to the Calcutta merchants.

Vegetables.—The marketing of vegetables presents a specially difficult problem chiefly on account of their perishable nature. A lack of uniformity in their price levels and in the conditions obtaining in different markets as also the extreme variability of their prices from time to time add considerably to the difficulty of marketing of vegetables. The potato crop in the Darjeeling district is also extensively financed on the *dadan* system.

General remarks.—The marketing of agricultural products is mainly in the hands of middlemen who are in the present state of things very well established. Any measurement of the profits of middlemen and a true estimate of the services rendered by them can be made only by a wide and detailed comparison of the prices as charged by the original producer and the prices charged at each stage in the process up to that of final disposal to the consumer. The means of communication and transport are also a determining factor in the profits of the middlemen.

Oral Evidence

19393. *The Chairman :* Rai Bahadur Mitra, you are Registrar of Co-operative Societies in the Presidency of Bengal ?—Yes.

19394. You have favoured this Commission with an interesting note of the evidence which you wish to give. Do you desire at this stage to make any statement of a general character or shall I proceed to ask you questions ?—I do not wish to make any observations of a general character now.

19395. I turn then to the note of your evidence as printed, and I propose in the main to confine my questions to that part of your evidence which touches co-operative organisations. I will ask you to turn to page 128. You say there that some of your co-operative night schools have been very successful. Who teaches in those night schools ?—They employ their own *gurus*, and some officers of the Co-operative Department go and lecture to them.

19396. Ordinarily it is the village school masters ?—They are special school masters.

19397. Have you whole-time *gurus* for these night schools ?—Yes.

19398. That is their sole occupation, I suppose ; or do they do other work ?—They do a little cultivation.

19399. They are educated cultivators ?—Yes.

19400. What sort of classes have you ?—It varies ; sometimes it is 30 or 40, sometimes 10 or 12.

19401. Do females attend these night schools at all ?—No.

19402. Is there any demand in this Presidency for adult female education ?—I have not come across any.

19403. It does not exist in your experience ?—No.

19404. Then you say on the same page, " I have a scheme under consideration to open primary schools in well-developed co-operative areas, which will be financed out of the profits made by co-operative societies in the areas." Are you hopeful that that scheme will mature ?—I think that scheme will mature. This was discussed at a conference and an attempt was made to rouse enthusiasm and interest. It will be further discussed at other conferences, and as soon as we have done some propaganda work we shall make an experiment in that direction.

19405. On the same page, you say " Ryots like short crops." I want an interpretation from you of " short crops " ; do you mean they are sown and reaped in a short period ?—Yes, sown and reaped in a short period, so that the land can be employed in growing another crop.

19406. You say that considerable success has been achieved in the distribution of jute seeds and various other seeds, and the success of the movement is primarily due to the efficacy of the seeds. Where do those seeds come from ?—From the Agricultural Department.

19407. Entirely ?—Entirely.

19408. Is the co-operative organisation making any net profit on the distribution of these seeds ?—Not much ; they are allowed a rebate of Rs. 2-8-0 per maund.

19409. So that you are only just covering your working charges, or perhaps a little more ?—We just cover the cost and get a little more. When the co-operative societies take up the work on a commercial scale they must of course have a margin of profit. At present they are trying to assist the Agricultural Department.

19410. On page 129, you are dealing with Posts and Telegraphs, but you do not mention there the savings organisation conducted by the post office. I want to ask you on that, have you any savings deposits in your societies ?—Almost all our co-operative societies accept deposits. I think, on the whole, if you analyse the savings bank work done by the post offices, you will find very few cultivators actually putting in their savings there. On the other hand, the co-operative societies do attract a lot of savings from the cultivators. I think in a few years all the savings will come to the co-operative societies instead of going to the post offices. We have introduced home savings boxes among the cultivators, and it is likely that these will attract more savings.

19411. Do they bring the savings in the box for deposit in the society ?—Yes. That is the idea. When a man becomes a member he is given a box. As soon as the box is full, he brings the box to the society ; the box is emptied and the amount is entered in the pass book ; the box is then locked and returned to him.

19412. The earning capacity of accumulated savings is something which the cultivator has hardly appreciated yet ?—He has begun to appreciate it. I think the introduction of these home safes has given a great impetus.

19413. And the habit of accepting interest ?—Yes. Then we have a system of collecting paddy. They put by paddy in small quantities and the collection becomes a fairly large one in time.

19414. Would you regard the co-operative movement as in any sense working in competition with the post office savings system ?—I expect that the post office will very soon

be unable to get deposits; all the deposits will come to the co-operative societies. If the bigger people go to the post office, the smaller people will go to their own co-operative societies.

19415. I gather from page 130 of your note that you are in favour of making an attempt to attain consolidation of fragmented holdings by voluntary, and if possible co-operative, methods. Nothing has yet been done ?—No; nothing has been done as yet.

19416. Probably you have studied the experiment in the Punjab ?—One of my assistants and Mr. McLean went over to the Punjab and studied it. Government have now sanctioned a special officer. We want to do it on the Punjab lines.

19417. From your long experience of rural public opinion in this Presidency, do you think there is any hope of success in that line ?—I do not commit myself to any opinion, but the experiment is worth trying.

19418. In the matter of irrigation (page 130), I see you are quite clear in your mind that there is an important field for minor irrigation schemes in the Presidency ?—I am absolutely certain of it. We have got about 400 irrigation societies in the Presidency.

19419. Already ?—Yes, already.

19420. Are they having difficulty in financing themselves ?—Absolutely no difficulty; our difficulty is to get plans and estimates.

19421. And technical advice ?—And technical advice.

19422. We have been told by the representative of another department that there is an officer in this Presidency whose business it is to provide technical advice in matters such as minor irrigation schemes. Have you ever come across that officer ?—That minor irrigation officer formerly worked under me. Now, under the new arrangement, he has been taken over by the Irrigation Department and he has been made a member of the regular staff of the Irrigation Department, so that he can no longer be regarded as a special officer for advising on minor irrigation. Of course in the place where he is posted there is nothing but minor irrigation work.

19423. Do you mean to say that he can no longer be regarded as a special officer for advising on minor irrigation works attached to the Co-operative Department ?—He cannot be so regarded. He is posted to a particular district and his work is connected with that particular district.

That is not what we were told.

19424. *Sir Ganga Ram:* Do I understand that your co-operative societies never obtain technical advice from the Irrigation Department ?—Yes, they obtain it from the Irrigation Department, but we want more facilities for obtaining it.

19425. You do obtain it ?—We do obtain it.

19426. *The Chairman:* Would you give the Commission the name of the post held by this officer ?—Originally he was called an Agricultural Engineer, and now I think he is called Irrigation Sub-Divisional Officer.

19427. What is his name ?—Mr. A. C. Chatterji. He is no longer exclusively connected with co-operative irrigation work.

19428. Apart from initiating new schemes of minor irrigation, you are also employing the co-operative organisation for clearing tanks and repairing works that have fallen into disrepair ?—We have done a good deal in that direction.

19429. I take it you attach the utmost importance to technical advice in these matters, do you not ?—Yes. So far as tank schemes are concerned we do not require technical advice, but as regards other minor schemes we do require technical advice.

19430. And terracing ?—Yes, and terracing. As a matter of fact for tank schemes, we have managed without technical advice.

19431. Would you pick out the Bankura and Birbhum schemes as particularly successful ?—Yes.

19432. How many members are there in the schemes ?—There are many schemes. In the Bankura and Birbhum schemes there are about 350 societies and you can take an average of 30 members for each society. In Birbhum there are 168 and in Bankura about 150.

19433. Two different districts and two groups of schemes ?—Yes. I can explain that to you. There are three schemes; pure tank schemes; then, what we call embankment schemes, where we store water coming down from catchment areas; and thirdly stream schemes, where we put an embankment across a stream and preserve the water that flows out and then by means of channels take it to the cultivators' fields.

19434. I suppose you have lift schemes as well ?—We have no lift schemes within our co-operative organisations.

19435. No lift schemes at all ?—None.

19436. How long have the best of these schemes been running ?—The first society was formed in 1916 ; it has got on very well. Then from 1921 the movement began to spread. The first scheme was in Khelar in the district of Midnapore. It is a stream scheme for the embankment of a stream.

19437. Did it begin to flag in 1916 ?—No, it has been successfully working since 1916. From 1916 to 1921 we did not pay special attention to it.

19438. Is the scheme of 1916 still flourishing ?—Yes.

19439. So that it looks as if these schemes have got real staying power ?—Yes, they have staying power.

19440. Have you any figures which you could lay before the Commission showing the improvement in fertility as the result of these schemes ?—I can give you figures* from my files.

19441. Could you get them and send them into the Secretaries ? If you give figures for two or three typical schemes, I think that would be very useful ?—Yes.

19442. On page 131, you say, " The policy of making effective embankments to prevent the ingress of salt water is not approved of by several irrigation authorities ?"—That is so. As a matter of fact in the matter of irrigation a real comprehensive irrigation policy is needed.

19443. Is it your suggestion in the paragraph just above the one I have been quoting from, that the attitude of landlords is unreasonable ?—I think to a certain extent it is unreasonable.

19444. What do you think is at the back of that position ?—To get the ryots more into their power.

19445. That is your view ; not a question of concern about the general drainage in the district ?—No.

19446. On the same page you say, " As far as possible seed distribution should be done by private agencies." I suppose you include co-operative societies ?—Yes ; as a matter of fact I mention it in the next sentence.

19447. Yes, you say, " An attempt should be made to develop seed industry through agricultural co-operative sale and supply societies." But I wanted to know whether you had any other private agencies in mind ?—I had other private agencies in my mind, because co-operative societies cannot cover the whole Province.

19448. You mean the distribution of improved seeds should be carried out on a commercial basis ?—Yes ; there should be private seed distributors.

19449. I take it the prime difficulty of extending that principle in this country is that, in the main, commercial distributors of seeds are also moneylenders ; is that the difficulty ?—That is a difficulty too.

19450. So long as they are meeting the demand for loans at reasonable rates, that of course is not a disadvantage, but the trouble begins when extortionate rates are claimed ?—Yes.

*

District	Number of irrigation societies	Irrigable area	Increased production
Bankura ..	107	50,612 *bighas* ..	151,800 maunds of paddy, vegetable and *rabi* crops. The value of crops is about Rs. 70,000.
Birbhum ..	168	17,134 " ..	34,270 maunds of paddy. The value of crop is Rs. 1,19,938.
Midnapore ..	1 (the society is about 15 years old)	400 acres ..	Rs. 4,000 every year.

The increased production in Midnapore is not due to any improvement in the productive power of the soil but to the elimination of losses which people used to sustain prior to the construction of scheme for want of sufficient rain in proper time. Owing to this factor the sale price of lands irrigated has increased by more than 50 per cent in comparison with lands of similar quality but not within the area of operations of the society.

R. B. J. M. Mitra.

19451. I take it that there is very strong sentiment against destroying monkeys ?—I am glad to say that this sentiment is gradually disappearing. Originally there was a class of people who ate monkeys; some villagers used to get them and keep them there; the monkeys knew that these people were dangerous to them and they disappeared when they came. But this class of monkey-eaters is now disappearing. I come across cases where Hindus actually pay money to people to kill them, but will not kill them themselves.

19452. I wonder whether the monkey-eaters were of great value to the village ?—They were. Sometimes they used to come from Chhota Nagpur to Birbhum.

19453. Did you ever come across cases where monkeys were taken away to a great distance and left there ?—No.

I am told the monkeys often got back to the village before the people who took them away.

19454. Do you think there is scope for organising animal improvement societies on a co-operative basis, for the provision of veterinary advice for instance ? Has that been attempted at all ?—We have not attempted it, but our milk societies get plenty of veterinary assistance.

19455. You probably agree that an improvement in the cattle of the Presidency would be an immense contribution to the agricultural problem ?—Yes.

19456. What about silage, or preservation of fodder by the method of the silo ?—I think it has not been tried much, and from what little I have heard of experiments in that direction, it has not entirely succeeded in Bengal.

19457. That is a matter which ought not to be turned down without careful investigation?—I think so.

19458. I see in your note that you mention tree cotton as likely to be useful. Do you think it is of any commercial value ?—No, I am not thinking of the commercial value but as a subsidiary industry for the people; if they can grow their own cotton and spin it with a *charka*, it would be of great economic value to them. I have seen tree cotton being grown in many places, and they are using it, but I have never discussed it with the people or considered its commercial aspect.

19459. *Sir Thomas Middleton:* Does it grow on tall trees ?—It is a particular kind of cotton; tree cotton is rather perennial.

19460. Is it of the variety with pink flowers ?—I do not know. It is not *shimul* cotton; it is tree cotton; *shimul* cotton is used for upholstering.

19461. *Sir Ganga Ram:* For how many years does the tree last ?—It lasts for about twelve years.

19462. And every year it goes on giving cotton ?—Yes.

19463. *The Chairman:* Has co-operation touched the life of the agricultural labourer at all ?—Not much, except that some of the agricultural labourers who are permanent residents of the village often join societies and get small loans.

19464. Have you any labour societies ?—No.

19465. I want to ask you a question or two about your own work and experience in co-operation. Do you feel that your machinery for watching the activities of your existing societies is sufficiently efficient to enable you to see which society is doing well and which society is failing ?—It is efficient, but not sufficient.

19466. So far as it goes, you think you have a pretty good idea as to whether a society is being conducted in a proper manner ?—Yes. We want more staff; for instance, our audit staff ought to be strengthened; even the societies paying the fees are not yet getting the full audit staff.

19467. Credit societies form the greater part of your total ?—Yes.

19468. Who manages these credit societies ?—The village panchayats; the societies have their committees of management.

19469. How much expert advice or assistance do they get ?—There is the annual audit. They are usually affiliated to the central society; the central society has got staff to go round and assist them in book-keeping and so forth, and tries to teach them the principles of co-operation; then there is the inspection by the superior officers occasionally.

19470. You have the supervising union organisation ?—We do not call them supervising unions here; we have practically no supervising unions; it is our central banks which supervise.

19471. You have got your primary societies; are they grouped ?—They are federated into Central Banks.

19472. Straight to the Central Bank without any intermediate organisation ?—Yes, because the area of operation of a Central Bank is very limited.

19473. Territorially ?—Territorially it is very restricted; it will come down probably to a *thana* limit; for each *thana* limit we will have a Central Bank.

19474. How many Central Banks have you ?—About 120.

19475. Above the Central Bank, have you a central organisation ?—We have got the Provincial Bank.

19476. Is that the apex bank ?—Yes. Then, on the propaganda side, we have got the Bengal Co-operative Organisation Society, which is a federation of all the societies in the Presidency doing propaganda work; it has just been reorganised.

19477. That is the head of the whole movement ?—Yes.

19478. *Professor Gangulee :* On its propaganda side ?—Yes, giving them advice and so forth; the propaganda and organisation side.

19479. *The Chairman :* Do these Central Banks call meetings of representatives from the primary societies to discuss the movement ?—Yes, they do so very often.

19480. To discuss the movement in general, or only on its financial side ?—To discuss the movement in general.

19481. So that they are, in a sense, in the position of supervising unions ?—Yes, combined with banking duties.

19482. In what language are the meetings of the Central Banks carried on ?—In Bengali.

19483. Entirely in the vernacular ?—Yes.

19484. Never in English ?—Never in English.

19485. *Sir Ganga Ram :* In what language are the accounts kept ?—The majority of them are kept in Bengali. Some of them are in English, but the tendency is to revert to Bengali.

19486. *Professor Gangulee :* Their accounts are kept in the vernacular ?—In the case of the majority of the Central Banks, yes.

19487. Is it Bengali accountancy ?—Yes.

19488. *The Chairman :* How about the Provincial Bank; does that provide a centre for discussion apart from financial matters ?—Our Provincial Bank is mostly financial.

19489. You go from the Central Bank to the central organisation ?—Yes.

19490. Are the discussions of the central organisation carried on in the vernacular or in English ?—In the vernacular.

19491. So that you do get representatives of the primary societies at your annual meeting ?—Yes; they are taking a very intelligent interest in it. Yesterday I heard that some primary societies were trying to get rid of townsmen and trying to manage their affairs themselves. In one or two Central Banks there is a little domination of the townspeople, but the recent tendency is for the members of the primary societies to assert themselves. It is a very satisfactory feature, to see how intelligently they take an interest in the proceedings.

19492. Are you yourself glad of this tendency to send back the townsmen to the town ?—We encourage them in that; that is the policy of the department.

19493. *Professor Gangulee :* What is the attitude of the town co-operators towards that tendency ?—Sometimes it is not satisfactory; they resent it. Yesterday I was told that there was a discussion in a society about the dividend to be paid; the village people insisted that the dividend should be paid at 6¼ per cent whereas the townspeople said " We will sever our connection with the society if it is not paid at the rate of 9⅜." Sometimes the townspeople resent it.

19494. *The Chairman :* Do you attach great importance to the educative value of this movement as compared with its purely economic value ?—I place more value on the educative side than on the economic side.

19495. Have you seen any tendency on the part of the credit societies to degenerate into machines for the provision of easy credit ?—Yes; all our areas are not of the same standard; in many areas they are degenerating into credit machines, but we go there and try to infuse new life into them.

19496. Have you noticed any tendency on the part of moneylenders to work their way into the societies and get to the head ?—No, but I have noticed undoubtedly a

tendency on the part of moneylenders to reduce their rate of interest, and they try to induce people not to join co-operative societies. In our well-developed areas throughout the Presidency one result of the co-operative societies has been distinctly to lower the rates of interest charged by moneylenders.

19497. Do any of the moneylenders come freely into the societies yet?—In one or two areas no moneylenders exist; they have put all their money into co-operative societies; but in many other places moneylenders do exist in spite of co-operative societies; it is all a question of propaganda and efficient supervision.

19498. Are you of opinion, then, that sufficient official supervision is essential now and will be necessary for some time?—Our supervision should be confined to the statutory duties imposed on us by the Co-operative Societies Act; that is sufficient for our purpose.

19499. Who carries out super-audit here?—We have Inspectors to do it.

19500. How many of them?—There are about 80.

19501. What is their pay?—Rs. 125 to Rs. 300.

19502. Do you ever have audit by superior officers?—Some of the Assistant Registrars do the audit.

19503. Do they find that the work of the Inspectors is good?—They are not all of them good; there are some inefficient men, but on the whole we have got an efficient staff of Inspectors. It is not sufficient, as I have said, but it is efficient.

19504. Have you come across cases of members having borrowed from societies and then relending the money at higher rates of interest?—It is mostly common in urban areas; I have come across many instances where people have borrowed for that purpose; not in village areas.

19505. Could you say just a word or two about the constitution of the Bengal Co-operative Organisation Society?—Out of a total of 12,000 societies, 6,000 are affiliated to it. We have got a scale for election of delegates; every 100 village societies, on invitation, elect one delegate; that constitutes our general meeting. Every central society sends one delegate, and these delegates appoint a central board; the central board meets twice a year and settles the policy; there is a working committee of eleven members which meets every month and conducts the work of the society.

19506. Are there representatives of all the Central Banks?—Yes; a Central Bank is a Central Society.

19507. Apart from this organisation which you have been describing, are there any land mortgage banks in the Presidency?—There is one land mortgage bank in this Presidency which started about a year ago; we are watching its work.

19508. Is it affiliated in any way to the co-operative movement?—Yes; it is a co-operative land mortgage bank.

19509. What is its name?—The Naogaon Co-operative Land Mortgage Bank. It has converted itself into a land mortgage bank, but it was originally started as a credit society. They decided by a resolution to convert themselves into a land mortgage bank, and now they confine their work to land mortgage; they have made a change in their by-laws; it is in fact, if not in name, a land mortgage bank.

19510. Confining itself entirely to the provision of long-term credit?—Yes, and also the provision of ordinary credit by means of cash credit. The idea is that if a member takes a long-term loan for clearing his prior debts, he gets a cash credit for his ordinary agricultural operations.

19511. So that this bank is dealing with both classes, long and short-term credit?—Yes; but even short-term credit is based on the mortgage of the land, and it is operated by means of cash credit.

19512. Have they issued debentures?—No. They are now taking long-term deposits, and I am making a proposal to Government that Government should subscribe a portion of their debentures.

19513. Are those debentures founded on the collective credit of all the mortgages, or by blocks?—On collective credit.

19514. Are they offering shares to the public?—No, it is only to the members concerned.

19515. In your view, is this scheme likely to meet the requirements for long-term credit among the rural population?—I think so; but our difficulty in this Presidency is the Bengal Tenancy Act. In some places the ryots have not got the power to sell their lands without the permission of the zamindar, and the uncertainty about this matter is the real stumbling block.

19516. It affects credit?—Yes, and especially of the land mortgage banks.

19517. By reason of the fact that the tenant is not in a position to offer mortgage?—He can offer mortgage, but the mortgage cannot be foreclosed if the zamindar proves obstructive.

19518. On page 135 you say, "Another disadvantage of the present system is that loans are very often brought to the village from the Central Bank in a lump sum and distributed immediately to the members." Do you mean that the representatives of the primary societies go and get a large bag of cash?—They make an application and bring, say Rs. 2,000. Particularly one member may require the money at that time; another may want it after a month, but that is the time for distributing money, and if he does not take it then, later on he is not able to get it.

19519. Is there anything to prevent these primary societies operating by cheque?—That is what I am trying to introduce in one or two village societies. I am advocating that, and I think I shall succeed. The whole idea is that the Central Bank should give a cash credit to the village bank, and the village bank will also give cash credit to the members; or, even if it does not do that, when any member requires an emergency loan it can hand him over a cheque, and he can take it himself to the central bank and cash it. I think eventually the time will come when the member will be able to cash such cheques in his own village.

19520. I should think that would be the ideal arrangement, because the safe-keeping of cash must be a very difficult matter?—That is the ideal arrangement. It takes a long time to teach these people, but we are doing our best.

19521. Is any *taccavi* given through the co-operative organisation?—No.

19522. Would you like to see that done?—No. I do not think *taccavi* is popular in this Presidency.

19523. You would like to keep clear of Government loans under the Acts?—Yes. We do not require much Government finance. Our difficulty is to invest our surplus funds.

19524. On the same page, you refer to societies for the sale of produce, and you say a promising beginning has been made. On what basis are your societies paying for the produce of their members?—They pay the full market value.

19525. They pay the full market value as they take the stuff in?—Yes.

19526. In no case is the selling society asking the producer to take the trading risks?—The members collectively take the trading risks, because they supply the share capital.

19527. Obviously, as members of the society?—Yes.

19528. Are these societies confined entirely to the sale of produce grown by their members?—Yes, and on the supply side they also supply the necessaries of life.

19529. Do I understand that in no case do these selling societies handle produce grown by persons other than their members?—In some cases they have to, because they enter into contracts for the delivery of a certain quantity of goods, and that may oblige them to purchase outside.

19530. I am sure the point is in your mind, but of course when you come to that stage you reach a position where the sellers who are not members have all the advantages of cash down and take none of the trading risks?—But they do not get any bonus.

19531. They get no bonus at all?—That is so.

19532. Do most of these societies succeed in paying bonuses?—Some of the paddy societies have succeeded in doing so. This is the first year of our jute societies.

19533. You have hardly had time yet to assess the possibilities of this movement?—That is so.

19534. You said something about these societies purchasing the necessaries of life for their members. Do you believe in and advocate the principle of mixed-purpose societies, or do you prefer single-purpose societies?—So far as sale and supply are concerned, I believe in the mixed-purpose society. We find it difficult to get a double set of men to run two societies, and by having dual-purpose societies there is a quicker turnover of capital; when the jute is finished, you can buy paddy and supply that. Moreover, less capital is required. If you ask the cultivators to subscribe for shares in sale societies and supply societies they will find it difficult to get the necessary money, and they will probably think it is all nonsense their being asked to subscribe to this and that and the other.

19535. You mentioned quicker turnover of capital. What capital do you mean, the share capital of the society?—Yes, supplemented by the borrowed capital also.

19536. Take the case of a jute society; what capital is involved? It is very small, surely?—One of the jute societies has a share capital of Rs. 1,00,000 and it has borrowed Rs. 3,00,000 and will handle Rs. 40,00,000 worth of jute.

19537. They have godowns?—Yes, and baling machinery.

19538. Most of their capital will be tied up in those?—No. Baling machinery does not cost much.

19539. It is working capital, is it?—Yes. In some cases they do not own their buildings, but lease them.

19540. It looks as though your idea was to have a jute selling society converted into a purchasing society during that season of the year when it is not selling jute. Is that the idea?—Yes. I ask these societies to take up all agricultural produce that goes from the area in bulk and all the necessaries of life which come into the area in bulk. We are not setting up grocery shops doing a small business, but dealing with articles which are handled in bulk.

19541. The multiple-purpose society involves complication in accountancy and is apt to lead to a loss of direction in management, is it not?—I do not think so, if you have working committees for the different articles you deal with competent accountants.

19542. *Dr. Hyder:* Working committees in the same village?—A working committee for each class of commodities dealt with.

19543. *The Chairman:* I am interested by what you say on page 136 about anti-malaria and public health societies. Is this work connected with the work of Rai Bahadur Dr. G. C. Chatterjee at all?—Yes.

19544. You have not mentioned his name?—I do not think I have mentioned any names.

19545. Has he been instrumental in initiating this movement?—He was responsible for initiating the movement. The first society started was in his own village. We had to lend our officers for organisation purposes, but he has been the life and soul of the movement and undoubtedly has succeeded in interesting the people in rural sanitation.

19546. How long has he been at this work?—Seven or eight years.

19547. There again you have had a long enough period to be fairly certain that these societies are going to survive?—I am not at all certain about it, because the movement is based too much on the personal enthusiasm of one or two persons. It is not on a proper economic basis, and as a matter of fact I have stopped the registration of these societies until I can get Government to declare their policy with respect to them.

19548. What exactly do you mean by that?—The central organisation is in Calcutta and is not in touch with the societies in outlying districts and cannot exercise proper supervision. I want to set up a committee in every district which will assist the central society. One central organisation in Calcutta cannot look after the large number of anti-malaria societies which exist, especially when they are situated in outlying districts, and many people say it is the duty of the Union Boards to look after sanitation, and that if you set up another agency there will be friction. There ought to be a definite declaration of policy in the matter, and I have suggested to Government that a conference should be held.

19549. What is your advice as between the two principles you have mentioned?—I would emphasise the importance of the Union Boards taking up sanitation; but when there is a genuine, and not an artificial demand for them, I would register voluntary organisations. The difficulty is that, in the case of several societies, the demand is artificial; there is no proper economic basis.

19550. Let me put it in this way. Do you not think the demand for work of this sort may be perfectly genuine without being founded on any economic basis?—That is so; but they cannot be registered under the Co-operative Societies' Act unless there is an economic object.

19551. That may be the fault of the Act?—I think they ought to have a special Act for these societies.

19552. I do not see how you are going to put an anti-malaria society on what you are pleased to call an economic basis?—We have another type of society, recently started, with which the Rai Bahadur has nothing to do, called public health societies. They are trying to put them on an economic basis.

19553. In what way?—By taking leases of tanks and stocking fish, raising adequate share capital, clearing tanks and removing sources of malaria in that way.

19554. Putting fish in so as to make some money, or to eat the mosquitoes ?—Both, and then they get a return on their share capital. At present one of the difficulties is that societies are started with a very small share capital and depend mostly on subscriptions. When once inspecting a society I asked them what they did if people did not pay their subscriptions, and they said "We just write it off." I told them that would not do. They are not on a proper economic basis.

19555. Is there at the back of your mind the feeling that real interest on the part of the members is not likely to be permanent unless they have a financial stake in the organisation ? Is that your view ?—So far as co-operative societies are concerned, I would insist that there should be a permanent financial stake. The ordinary work of sanitation can go on without that, of course.

19556. I should have thought a society designed to prevent the spread of malaria by putting kerosene on the water in tanks had better leave fishing to other people ?—There is scope for these societies.

19557. On page 136 in answer to sub-section (*c*), you say, "I think it is very necessary that legislation should be undertaken to compel persons to join for the common benefit of all, but that they should not be compelled to join as members of co-operative associations against their wishes," and later on you say, "But powers should be given to co-operative societies to apply to Collectors to compel persons who may derive any benefit from the operations of the society to contribute to the funds of the society and to continue to enjoy such benefits." Do you really think that is a practical suggestion ?—I do not see how you can make progress with these irrigation and other societies if a small minority of people say they will not join in the scheme and will not subscribe or pay their quota towards the execution of works. I have mentioned in the course of my evidence the progress which has been made with irrigation societies. We could have made greater progress, but we have to take in all the people who are benefited by a scheme.

19558. You see how far the principle is going to take you ? Your credit societies have reduced the rate of interest, so that, applying this principle, you would have to compel everybody who borrows money from a moneylender who has reduced his rate of interest as a consequence of the existence of the credit society to join the credit society or make some contribution ?—I do not think there is much analogy between the two.

I think you will have difficulty in carrying out your plan.

19559. *Sir Henry Lawrence :* With regard to the distribution of jute seed, what proportion of the jute seed derived from the Agricultural Department is distributed through your co-operative societies ?—I cannot tell you the exact proportion, but a large quantity of the seed is distributed through the co-operative societies.

19560. Is the distribution at its very beginning now, or have you had some years' experience of it ?—Two or three years' experience.

19561. Is it the seed which goes through the co-operative societies which reaches the ryot too late to enable him to use it at the proper time ?—That happens in some cases. One of our greatest drawbacks in popularising the seed has been the delay in the supply of seed in some areas ; but I think the Agricultural Department is taking up the matter and has been able to effect an improvement.

19562. Is the delay due to the fact that the seed is not available ?—I do not know. We send our indents to the Agricultural Department, and in some places we have found it does not come in time.

19563. So far the Agricultural Department is only in a position to supply a comparatively small amount ?—Yes.

19564. I think the figure in the report was 3,000 maunds. How many acres does that represent ?—About 50,000 acres.

19565. Fifteen or sixteen acres to the maund ?—Yes.

19566. *Professor Gangulee :* What is the total area under jute ?—I think 5,000 square miles.

19567. *Sir Henry Lawrence :* 3,200,000 acres ?—Yes.

19568. Out of which about 50,000 are covered ?—Yes.

19569. Do you hope to expand that very much in the near future ?—I think it is capable of expansion and I hope it may be expanded.

19570. On page 131 you ask for a seed which will involve a fibre acceptable both to Dundee and Calcutta. Is not the quality of the fibre which those two sets of mills

require very different ?—There is some difference, but I think it possible to produce a fibre which will suit both.

19571. What is the object of having one seed to suit both sets of conditions ?—Sometimes it is possible to get a better price from the people who export to Dundee and at other times a better price is obtained from the Calcutta mills; but if the fibre can be used by one set of mills only you are not a free agent when you come to sell.

19572. What you want is to obtain competition between the two mills, so as to get a better price for the ryot ?—Yes.

19573. That is your object ?—Yes.

19574. *Sir Ganga Ram:* These societies undertake irrigation schemes ?—We have got special irrigation societies for that.

19575. Do they devise the schemes themselves, or act on the advice of an engineer, or what ?—Small schemes like tanks they do themselves.

19576. Without any advice ?—Yes, except that provided by our co-operative staff. I do not think they require advice; ordinary people know a good deal about these things. In the case of stream schemes and so on, they require technical advice.

19577. Whose advice do they take ? That of a Government or a private engineer ?—Of a Government engineer.

19578. Suppose a scheme involves taking water from a river, do they pay any royalty to Government for the use of the water ?—I have not come across an instance where a royalty has been paid.

19579. You have instances where water is taken from rivers ?—From small streams. We have not any co-operative schemes connected with rivers.

19580. Do you apply to Government for sanction to take the water ?—No, I think they have prescriptive rights in most of them.

19581. Is not the water the Government's ?—I do not think Government claims royalties. I know of no instance of that.

19582. Have they not got a claim ?—I do not know; it has never been asked for.

19583. You say the societies sell and buy produce ?—Yes.

19584. The society sells it. Who stands the risk of fluctuations ?—The society.

19585. But one man must buy and sell; all the members cannot do it ?—The ultimate financial risk is borne by the society, but the society appoints its own agent and brokers to sell.

19586. Sometimes in jute and cotton there is selling power, and sometimes there is hedging; who does that ?—The society's agent; it has an agent in Calcutta.

19587. If it goes against the society, can they claim they have been hoodwinked ?—The society has only itself to thank if it appoints an agent who cannot do his business properly.

19588. It is a serious risk ?—There is a serious risk.

19589. The rate may fall from day to day ?—The society has got its agent in Calcutta and its manager in local stations to advise it; they are in constant telegraphic communications with each other.

19590. In jute purchases have all the mills some pooling system ?—I really do not know the inside working of the mills.

19591. Is there no regular pooling ? Sometimes in cotton and jute they adopt the pooling system and agree not to pay more than so much or so much per maund goes into the pool ?—There is a general impression that there is a pool. But I do not know of any actual instances.

19592. Do you mean to say that they pool in private ? The pool is always publicly known ?—It is not publicly known.

19593. The agreements are drawn up ?—I have not come across any such case. I do not think there is such a pooling system. But I believe mills do take counsel with each other and decide about the lines of buying and the prices offered, but then it is not known to the public.

19594. I am surprised to hear that. Now suppose some people take it into their heads to take water from the river, they do not take anybody's sanction to do it ? Can they touch public rivers ?—If they want to put up an embankment ?

19595. No, I am not talking of embankments, but in other Provinces the consent of the Government is required before water can be taken ?—I think in Bengal nobody takes

any sanction. Government allow free use of the water. But if you embank a river or throw a weir across then you want sanction.

19596. Sometimes taking up the river on the up-stream side may damage the interests of the people on the lower side, and there is a law in our Province that nobody can take river water without Government sanction ?—It is possible that if in the upper reaches you throw up an embankment it will restrict the supply of water lower down.

19597. Embankment is allowed in any case at all ?—They often have a weir. They often throw out a *kutcha* weir. If it interferes with others, the man applies to the Collector.

19598. Do you mean a sand weir ?—An earthen dam.

19599. How long will that stand ?—Year by year they replace it. That is in the case of small rivers.

19600. *Sir Thomas Middleton :* You have said that your Inspectors of co-operative societies get salaries of Rs. 125 ?—Rs. 125 to Rs. 300.

19601. Is Rs. 125 the initial salary ?—Yes.

19602. What do they rise up to ?—Rs. 300.

19603. Are there prospects of going further ?—They become Divisional Auditors and they are also sometimes promoted to Sub-Deputy Collectorships.

19604. If they become auditors what is the salary in that case ?—Rs. 300 to 500.

19605. At what age is a man appointed as an Inspector ? What amount of experience has he had before you take him ?—There are two methods of recruitment, by promotion from auditorship and by direct recruitment. If direct recruitment is done he gets a training and he must be below 25 years of age. He gets a training and then he is put in.

19606. How long is he trained, for a year or two years ?—That depends. It is for five or six months and then he is put in charge of the area. That area is constantly supervised by District Auditors and Assistant Registrars and in this way he gets experience.

19607. Say a man is directly recruited, will he be 25 or 26 ?—Yes.

19608. If he is promoted, it will be about what age ?—That varies from 35 to 40.

19609. So they are mature men ?—They are mature men.

19610. You have pointed out in connection with agricultural education that there is not enough Government land for unemployed middle class youths, and that is obvious, I think. Are you of opinion that the middle class youth would be a suitable officer for agricultural work ?—I think he will be, because most of our middle class youths come from villages; their relations are employed on the land; they are not entirely town-bred people.

19611. You think suitable candidates could be found ?—Yes.

19612. You would agree, of course, that to be suitable he must be properly trained just as your own men are ?—Yes.

19613. What kind of training do you think would be necessary in order to make this middle class youth suitable for agricultural work ?—I would first of all give him a good grounding in science connected with agriculture, and then give him a two years' practical course on a farm.

19614. *Sir Ganga Ram :* Science ?—A good grounding in science on which agriculture is based; chemistry, botany and such things.

19615. *Sir Thomas Middleton :* Supposing I make the statement that his agricultural grounding should be got by studying science up to not less than the Intermediate stage, then two or three years of technical training and that then in order to make a good district officer he ought to have something like five years' experience or more of agricultural work; would you or would you not agree ?—The more experience he has of agriculture the more likely he is to make an efficient agricultural officer. That I quite admit.

19616. Would you agree with me that directly he leaves a teaching institution he is not likely to make a satisfactory district officer ?—I quite agree with you. But if you keep him too long on the farm he might lose his administrative ability.

19617. The point is this. At present the pay he gets as a district officer would be comparable with the pay which you offer, Rs. 125 rising to 300. But, just as your men have got to get experience somehow, this man has got to get experience. He can only get experience of the right kind by doing some subordinate type of work in the districts. We cannot expect him to earn a considerable salary at that stage. I want to know what

your view is of the salary that would have to be offered to a young man trained in the way I have indicated, to attract a sufficient number into a subordinate grade in the Agricultural Department ?—He will ultimately get the pay of an Inspector.

19618. I am assuming that he will be a satisfactory officer who will rise to be an Inspector and who may go further, just as your officers do. What is wanted in order to induce the trained man to offer himself ?—At least Rs. 75 to Rs. 100, I should say.

19619. That is your estimate ?—That is my estimate, if you want really to attract a good class of men.

19620. *Dr. Hyder :* In regard to this question of State aid to co-operation, tell me how much are you spending out of provincial revenues on co-operation ?—About 3 or 4 lakhs. Our audit staff is practically supported on audit fees. We refund to the Government the audit fees.

19621. Do you know how much they are spending in the Punjab ?—No. I knew it; but I cannot recollect it now.

19622. I find from a comparison of figures that these Provinces, the Punjab, Madras and Bombay, are spending much more on co-operation than the Presidency of Bengal ?—Yes, that is so.

19623. And surely they have not got to deal with a larger population than this Presidency ?—We get more local non-official assistance and there is another thing, as I have told you, our staff is under-manned. We do not even get full staff of auditors which the societies are entitled to get, because they themselves pay for them.

19624. In regard to this question of supervision and audit, how many societies are there for one Assistant Registrar ?—Well, we do not go by the number of societies; we go by territorial limits. We have one Assistant Registrar for each of the Commissioner's Divisions and that varies from 2,000 to 3,000.

19625. Do you not think that this is a large number ? You have got five Divisions, I understand, and the number per Division is about 3,000. Do you think one man can manage 3,000 ?—He has Assistants under him. But I do not think that Government can indefinitely extend the staff of the Co-operative Department. I think the strength of the staff must be determined territorially; except the audit staff, because the number of societies which a man can audit is limited. My own idea is that there should be fixed territorial staff and the staff of auditors should automatically increase with the increase in the number of societies.

19626. How many societies do you have at present per one auditor ?—One hundred.

19627. That is the ideal of the Maclagan Committee ?—Yes, but I do not think they can go beyond 100.

19628. And you are following that ideal ?—I am following the ideal; but my staff is not according to that standard, but is less than that.

19629. When do you have periods of surplus money in the co-operative movement ?—Our period of surplus is from October to February.

19630. That is to say when the crops are being sown ?—We get money from the jute crop and the paddy crop and from January the money for financing the jute crop begins to go out, but the surplus period is from October to February, I think.

19631. Does this period coincide with outside stringency ?—The period certainly coincides with stringency in the Calcutta money market.

19632. Are you able to invest ?—We are investing through exchange banks, we invest a lot of money with exchange banks in this period.

19633. When is your period of stringency ?—My period of stringency starts in May and extends to June, July, August and September.

19634. Were you in charge of this movement last year ?—Yes.

19635. When we were in Madras, we found that you borrowed 5 lakhs from the Central Provincial Urban Bank of Madras. Was that during this period ?—Last year, yes, during this period; and similarly we lend out during our surplus period to other Provincial Banks.

19636. With regard to these irrigation societies; are you quite satisfied with the help that you obtain from the Irrigation Officer or the Irrigation Department of the Government of Bengal ?—I am afraid I am not very satisfied.

19637. To what is the dissatisfaction due ?—They change their plans. I do not think the Irrigation Department have been able to give us satisfactory plans. The Irrigation

society sends it to the Government in the Irrigation Department and there it is often changed; and there is one society which started in 1921; it has not yet been completed. We have not got the completion certificate yet and within this period the estimates have been raised about five times and it is very difficult to get the confidence of people when you are continually changing your plans and estimates.

19638. *Sir Ganga Ram:* Have you no private engineers here to give you advice ?—We have not sought the help of private engineers.

19639. Never ?—We have never sought it; but you see the societies here are too poor yet. When they are strong enough they may have a federation of their own and then employ their own engineer; but in the initial stage the societies require technical advice from Government.

19640. *Dr. Hyder:* Do I understand then that they are optimistic when they go to them for advice in the matter of estimates but become pessimistic when they have given their estimates to you and increase them ?—Yes.

19641. With regard to your societies, as Registrar are you quite satisfied with the soundness of this movement, as measured by the number of A class societies ?—I am quite satisfied with the soundness of the movement as a whole; but I am not satisfied with the soundness of the movement in every area. The very fact that people who live in the villages and know the work of the societies are depositing their money shows they have entire confidence in the movement.

19642. Which is your most promising Division or area ? Chittagong ?—Chittagong and Burdwan. One or two had areas existing in almost every Division.

19643. *Mr. Gupta:* Do you resent the co-operation of district officers and other Government officers in advancing the cause of your department in any way ? I am asking that question because I saw in the papers that some officers were of opinion that it was rather disastrous. Is it your feeling ?—My feeling is to welcome the assistance of every District Officer who is willing to give advice and assistance, and as a matter of fact the department are trying to seek the advice of the District Officers. But unfortunately as a system, I strongly deprecate the system of placing definite responsibilities on District Officers to further the co-operative movement. As a matter of fact, this system has worked very badly in Bengal.

19644. What system ?—That system of placing the district officers definitely into the scheme; it has worked very badly.

19645. Is there any such system ?—When Sir Nicholas Beatson Bell was Member, he compelled me to make every District Officer *ex-officio* Chairman.

19646. But that is not the system now, is it ?—I do not advocate the system because I find that the majority of the district officers take no interest in anything except law and order.

19647. It is very disappointing to hear that ?—I can give you hundreds of instances.

19648. How did these irrigation societies to which you have referred in your report come into existence ?—They have come into existence with the help of the District Officers; but, then, even if the District Officers had not helped, the movement would have come into existence.

19649. That is a different matter ?—As I have said we are very anxious to get assistance of District Officers.

19650. You do not want to make it a rule ?—Quite. As a matter of fact, some of the District Officers have done excellent work; but once you make it a system, you get a class of officers who take no interest in anything but law and order, and you get a class which is very enthusiastic in promoting the welfare of the people.

19651. Just as you have black sheep amongst your societies ?—But I think the number of black sheep is increasing in that way.

19652. What about these jute sale societies to which you have referred ? For instance, in my Division there is a most promising jute society. Is that due entirely to the efforts of the Sub-Divisional Officer ?—Not entirely. I do not call that an A class society.

19653. It is the only society in this Division ?—The Sub-Divisional Officer has taken great interest in it, but he is a friend of mine and of my Assistant Registrar, and so I could get him to do so, but if you ask me I can give you many instances of what Sub-Divisional Officers have done about their chairmanship, I believe, under instructions from the District Officers.

19654. Let us not go into these details. I only want to know whether you resent their assistance ?—We do not resent it ; we welcome it in every way. We will gladly take it when it is given in the proper spirit and we think it leads to excellent results.

19655. *Professor Gangulee :* But do you make any effort to get their co-operation ?—We make an effort ; but we cannot go on always asking them to give us assistance.

19656. *Mr. Gupta :* About the indebtedness of the agriculturist, of course the primary object of this movement is to help the agriculturist and relieve agricultural indebtedness. Have you any figures to show exactly how it has worked from year to year and what amount of indebtedness is being wiped off ?—We collected statistics some years ago, but we cannot collect statistics every year.

19657. Would it not be a good thing if you had some sort of reliable figures ?—It would be a good thing ; but I want staff for it. I think if that staff is employed in organisation and propaganda, it will produce more useful results.

19658. But that is one of the most important objects we have in view. For instance, in connection with some question, I asked for figures and I was told there were no statistics. Do you not think that it is desirable to have figures ?—It is desirable if we get the staff.

19659. I wanted your opinion ?—It is desirable, undoubtedly.

19660. What about agricultural associations ? Have you got any ? Are they making good progress ?—Agricultural associations to supply agricultural necessaries, such as manures and seeds, we have.

19661. Have you got many ?—We have five or six of them ; two of them are doing good work.

19662. Are they doing any other work ?—Our latest effort was to start supply societies to take up agricultural work also.

19663. It is of the complex type you mentioned to the Chairman ?—Yes.

19664. In case you do that, would you like to have closer co-operation with agricultural officers ?—We are co-operating with each other. It will help us undoubtedly to achieve our object if we have closer co-operation.

19665. Turning to your remarks about the private anti-malaria societies and the work of the Union Boards, do you think there is any conflict in both working in the same areas ?—The question of conflict arises in everything.

19666. What is the conflict ?—In your Division there is no conflict.

19667. It is not a personal matter ?—It is not a personal matter at all ; it is a question of working the system.

19668. Under the system we have been trying to get co-operation ; so far from their being any conflict we want co-operation ?—Many officers of the Union Boards think that they ought to look after sanitation. If you take away this work from them, they lose their importance.

19669. About putting the anti-malaria societies on an economic basis, do you realise there is no economic object ? All they do is to pay the money to employ a doctor and to clear the tanks with the object of killing the mosquito larvæ ; that is all. I suppose as far as your own department is concerned you are not encouraging the idea that they are starting these societies in order to make money. Can that be their idea ?—No.

19670. As regards irrigation societies, your suggestion is that there ought to be some sort of compulsion to make members join. Do you think we should go in for compulsion ? —Not compulsion to become members of the societies, but compulsion to contribute towards the cost of a project.

19671. Do you not think that compulsion will militate against the fundamental principles of co-operation ?—My method will not militate against the principles of co-operation. Supposing a co-operative society takes up a work and a small minority remain out. All that I want is that the Collector should assess the cost of the scheme and compel the minority to pay a proportion of the cost of the work to the society.

19672. In connection with most of the irrigation societies, the Collectors have helped their formation by persuading people to join them ?—Sometimes they have ; sometimes they have not.

19673. In Birbhum and Bankura they have ?—I am talking of the whole Presidency ; in many cases the Collectors have failed.

19674. Rai Bahadur Bannerji will tell you all that happened in his district. But I ask you, would not such compulsion militate against the principles of co-operation ?—

It would not. If a majority of the people form a society, they should certainly be able to apply to the Collector to compel the others to pay a proportion of the cost.

19675. If they do not join ?—Yes.

19676. *Sir James MacKenna:* What rate of interest do you offer for savings deposits in the Provincial Bank ?—It varies according to season. At times we get loans on Government paper at 1½ per cent, ordinarily we offer 4 to 5 per cent but there is no fixed rate.

19677. Between 4 and 6 ?—Between 1½ and 6. Of late there has been a reduction in the rate of interest.

19678. Practically you follow the prevailing rate of interest ?—Yes.

19679. Is there any Government money in this bank ?—Absolutely none.

19680. Government's contribution is limited to payment of the staff ?—No; they have no Government staff in the bank.

19681. I mean in the movement ?—Yes.

19682. You state the Central Banks operate in small territorial areas. You have got a very large number of Central Banks. To what extent do you attract money to the Central Banks from their territorial areas ?—Some of them have succeeded remarkably well in tapping local money.

19683. What proportion of their capital does it form ?—A large proportion of their capital.

19684. What is the capital of the Central Banks ?—It varies from Rs. 50,000 to Rs. 2,00,000.

19685. Nothing more than two lakhs ?—That is in small territorial areas; of course, in bigger places it is different.

19686. Are you satisfied with the repayment of principal and interest ?—It is susceptible of improvement, but of late years there has been improvement.

19687. Is your Provincial Bank satisfied with it ? Ultimately, they are the people most concerned ?—The Provincial Bank is satisfied. Last year they got repayment in full, and sometimes they get repayment even before maturity. The Provincial Bank gets repayment all the time. It is the Central Banks with small capital that suffer.

19688. It is the Central Banks that suffer ?—Yes. The Provincial Bank will get repayment; there is no doubt about it.

19689. Is there a feeling in Bengal that Government stand behind the co-operative movement ?—Absolutely none. I will give an instance. A Sub-Divisional Officer was Chairman of a Central Bank and there was defalcation to the extent of Rs. 80,000 and people knew very well that they could not make Government responsible. However, they feel this, that there is Government supervision, and there is restriction, just as people feel about the Imperial Bank. They know that the co-operative societies work under the restrictions of the Co-operative Societies Act.

19690. You have got very large charges, you told us, for your Assistant Registrars. Do you consider that the amount of touring your officers do is adequate considering the size of the charges ?—I do not think it is adequate. Unfortunately owing to the curtailment of travelling allowances, I cannot insist on their touring more frequently, because they lose money consistently.

19691. They actually lose ?—Yes.

19692. They reduced the Assistant Registrars from first class to second class ?—Yes. It is all right for a man who has got extensive touring but a man who has to go into the interior loses.

19693. The Registrar himself does not tour very much ?—That is also because the Deputy Registrar's post has been abolished. Last year I was able to do some work.

19694. Curtailment of travelling allowances affects junior officers who lose ?—Yes. And they have taken away facilities for travelling under the recommendations of the Retrenchment Committee so that the Registrar finds it very difficult to do efficient touring.

19695. You have been connected with the movement for a long time now ?—Except for an interval of five years when I was connected with the Government of India.

19696. Do you think that the movement is making solid progress, in spite of mistakes ?—I am personally satisfied that the movement is making satisfactory progress, in spite of mistakes.

19697. You feel that ?—I have been connected with the department for a long time. For five years I was out of the job, and when I came back, I found that after all the movement was on a sound basis. It ought to be extended now, and that is the only way in which you can really assist the cultivators.

19698. You know a feeling of depression often comes over Registrars. You do not feel depressed ?—No. I have been reading the Burma report, and I have felt depressed over it.

19699. You really feel depressed ?—In reading the Burma report I felt depressed, but I do not feel that as regards Bengal.

19700. Do you think that the development of business habits is a very important matter ?—Yes.

19701. Almost as important as co-operation ?—Yes.

19702. You think that the repayment of principal and interest in time should be rubbed in ?—I feel there ought to be more punctuality. My figure of overdues is 24 per cent and I want to reduce it to 10 per cent.

19703. *Professor Gangulee :* Following your answer to Sir James MacKenna, with regard to the basis of your co-operative movement you say you are quite satisfied with the soundness of the basis. Can I take it that it has become a people's movement ?—It has become a people's movement in Bengal.

19704. Not spoon-fed by Government ?—No ; in this Province very little spoon-feeding is done by Government.

19705. You must have started a large number of societies since you have been connected with the movement for a long time. You have started many societies between 1905 and 1926. Could you give us an idea of the life and vitality of the offspring of your efforts ?—Some of them are thriving. The society in Khelar is the most flourishing in the Midnapore district.

19706. Are societies organised as credit societies developing other branches of co-operative work ?—They do a lot of arbitration work and social welfare work. There are really live societies who take much interest in their work.

19707. From credit societies do they develop other activities such as education, sanitation, etc. ?—Yes ; they are engaged in educational activities.

19708. Have they started schools ?—They have started schools and they subsidise schools.

19709. Could you tell us the causes of liquidation of your societies ?—Unsatisfactory organisation is one.

19710. What are the chief causes ?—The chief cause is the appropriation of the bulk of the loans by office-bearers.

19711. In the event of liquidation, what are the methods you follow ?—The methods are these. First of all we hold an enquiry and we ask the society whether they object to the liquidation. Then we consult the central society to which it is affiliated, and generally liquidation is settled upon the advice of the central society. Then we appoint a liquidator. The society can make an appeal to the Commissioner against my order of liquidation.

19712. And what is the result of this liquidation over that area ?—I think the result is pretty good ; it is a warning to the other societies.

19713. It does not act as a deterrent to the spread of the movement ?—The people know that these are being liquidated for their failure to pay their dues. Most of our liquidation is not on account of insolvency, but on account of bad management. It ceases to be co-operative if one or two of the people in the society manage it.

19714. These liquidations do not act as a set-back to the movement ?—No. As a matter of fact, I would not feel the slightest hesitation in liquidating a Central Bank if it is doing un-co-operative investments. It would not affect the movement.

19715. What about co-operative disputes ?—Disputes cannot be co-operative.

19716. I mean disputes among co-operative organisations, say, between a primary society and a Central Bank, or a primary society and a district bank ?—Well, there have been disputes. There was a dispute recently between a primary society and a central society. The primary society requisitioned an extraordinary meeting and passed a resolution.

19717. There are then disputes among the co-operators ?—This sort of dispute comes up to me for arbitration.

19718. In the note which was submitted by you sometime ago as Registrar of Co-operative Societies, it is stated "The main defect of the system of agricultural advances through the medium of co-operative societies is its rigidity." Can you amplify that ?—I have done so in reply to a question by the Chairman. A member may be in need of money at a particular time. He goes to the village panchayat, the village panchayat has to recommend the loan, the society then applies to the Central Bank, and the Central Bank has to hold a meeting and sanction it. I would recommend a system of cash credits to avoid this.

19719. How long does it take ?—It depends upon the nature of the Central Bank. If the Central Bank has got an able Secretary it takes about ten to twelve days; it sometimes takes a month. You cannot generalise on these things.

19720. As regards co-operative finance, what is the difference between your borrowing and lending rates ?—Here again the rate varies. The primary societies usually borrow at 9⅜ per cent and lend at 12½ per cent; and societies in Eastern Divisions borrow at 10 per cent and lend at 15 per cent.

19721. Even at that rate the loan is popular ?—Yes.

19722. Do you have any system of penal rates of interest ?—Some Central Banks have penal rates, but we do not advocate that, and we are trying to put a stop to the system of penal rates of interest.

19723. Who is the authority to sanction loans in a primary society; is it done by a committee or a secretary or any of the office-bearers ?—It is the village panchayat; the committee as a whole meets and sanctions them.

19724. It is the committee that considers the application; it is not done by any particular individual ?—In primary societies, it is the committee.

19725. In other societies ?—In the Central Banks the Board of Directors delegate that function to a working committee.

19726. What is the procedure to deal with loan applications ? When a member of a primary society wants a loan how would he proceed ?—The member of a primary society has got to go and tell his panchayat he wants a loan and the panchayat then submits the loan application to the Central Bank. The Central Bank sometimes makes enquiries by sending its supervisors, and then sanctions. If the Central Bank is in want of funds, it applies to the Provincial Bank.

19727. What time does it take ?—I think there are particular seasons when applications for loans come in largely. The Central Banks know that and they forecast their requirements and apply accordingly, but I have come across instances where it has taken a longer time than it ought to have taken.

19728. Is joint responsibility enforced ?—In the case of liquidation, very often it is enforced.

19729. In the case of granting loans, is it enforced ?—How can it be enforced in the case of granting loans ?

19730. Only in the case of liquidation it is enforced ?—Yes; you cannot enforce it in any other way.

19731. How is your reserve fund built up ?—It is built up out of the margin between the borrowing and the lending rate.

19732. How is it utilised ?—Most of the societies invest it separately, but there is a little reluctance on the part of primary societies to invest it separately; they would like to see it invested in the movement; a large part is invested in Central Banks and they are supposed to pass it on to the Provincial Bank.

19733. With regard to management, you have a committee of management ?—Yes.

19734. There is no paid staff employed in the Committee ?—Generally speaking, there is no paid staff; about half a dozen societies in the Province may have a paid secretary, on Rs. 3 or Rs. 4 a month. I would not place the number of such societies at more than a dozen.

19735. Do you find that the want of education is a serious handicap to the proper development of the co-operative spirit ?—It is, to a certain extent, a handicap.

19736. Is there any plan for improving the educational standard of the members ?—It cannot be done except by night schools and so forth, but then you cannot start night schools in connection with every society.

19737. Your Inspectors go and inspect the books of accounts, do they hold a class to teach co-operative principles, or to explain difficulties and so on ?—Yes ; the Auditors, after audit, are expected to hold a general meeting, to explain to the members co-operative principles.

19738. I wanted to know whether it is done ?—It is done ; I do not think it is done as well as it ought to be done, because we are not fully staffed.

19739. You have about 12,000 societies here, including credit and non-credit ?—Yes.

19740. Do women take part in your credit or non-credit societies ?—There are some women members.

19741. Is that in credit or non-credit societies ?—Both credit and non-credit societies.

19742. Have you started any special societies for women ?—We are experimenting with women's societies ; we have got five of them, and I have asked Government for an Inspectress, as they have in the Punjab.

19743. With regard to non-credit societies, you are convinced that they are capable of expansion ?—They are capable of indefinite expansion ; there is a genuine demand for them, but we cannot meet the demand.

19744. In what direction is the demand for non-credit societies ?—There is great demand for jute sale societies.

19745. The tendency is for sale societies ?—There is a great demand ; last year we were doing considerable propaganda with regard to sale societies.

19746. There is more demand for sale than for purchase societies ?—Yes.

19747. Are these non-credit societies connected with credit societies ?—No.

19748. Are they financially independent ; are they financed from sources other than co-operative credit organisations ?—I think some of the sale societies get loans from Provincial Bank.

19749. Some of your non-credit societies obtain their loans from the Provincial Bank ?—Yes, and some from the Central Banks.

19750. They are not independent ?—The management is quite independent and also the liability.

19751. Are there any grain banks in this Presidency ?—In the district of Bankura ; they have not been much of a success.

19752. Why ?—Management is difficult, account-keeping is difficult.

19753. With regard to co-operative irrigation societies, you say that you obtain technical advice from the Irrigation Department ; what do you mean by technical advice ? Do they draw up the scheme ?—We point out the scheme, and they give us the plan and estimates.

19754. They give you a plan and estimate ?—Yes, and sometimes they take upon themselves the task of executing it on behalf of the society.

19755. *Sir Ganga Ram :* What do they charge ?—I think there is some fixed charge, which is included in the estimate.

19756. How much is it ?—I do not remember the exact figure.

19757. *Professor Ganqulee :* The execution is sometimes done by the societies and sometimes by the Irrigation Department ?—The whole idea now is that we give a plan and estimate and the societies will execute it under the supervision of the technical officers, but the technical officers should not in any way be responsible for the safety of the plan or the manner in which it is executed.

19758. In the event of a failure, who is responsible ?—The society ought to be responsible ; but in Bengal things have been managed in such a way that it has made it possible for societies to make Government responsible for it, but it ought not to be so.

19759. The management is wrong ?—The way in which co-operation between the Irrigation Department and the Co-operative Department has been managed is not quite satisfactory.

19760. You agree there ?—Yes.

19761. How many Inspectors have you ?—Originally we had two but last year our staff was strengthened by the addition of ten more Inspectors ; their total strength is now twelve.

19762. What are their duties ?—The starting of societies, explaining the benefits of co-operative irrigation and, above all, bringing recalcitrant people who do not like to

join the movement round to become members of the society, and seeing that they keep their accounts properly.

19763. Their work is chiefly concerned with propaganda ?—Propaganda and supervision of the existing societies.

19764. How about your relationship with other departments ?—It is quite cordial.

19765. How is it with the Agricultural Department ?—It is quite cordial; we often consult the Director of Agriculture, and he and I often take counsel together.

19766. Do you distribute manure ?—One of our societies has taken up distribution of manure; generally there is no demand for manure, except that which can be had easily and for that you do not require a co-operative society.

19767. Do they distribute bonemeal ?—In Bengal, the price of bonemeal is beyond the capacity of the ordinary cultivator to pay; bonemeal is exported out of the country.

19768. There is a demand for bonemeal ?—The Agricultural Department has been successful in creating a demand for it in certain area.

19769. *Dr. Hyder:* What is the destination of the bonemeal exported from this country ?—Java; it is used there for sugarcane.

19770. *Professor Gangulee:* There is a demand created for bonemeal by the Department of Agriculture, and because it is exported the people here cannot purchase it ?—It is exported to Java, of course, people who can afford to do so purchase it at a high rate, but our ordinary cultivators cannot do so. I think it is wrong to export bonemeal out of the country.

19771. *The Raja of Parlakimedi:* Have you tried to store sufficient bonemeal in your co-operative societies ?—About ten years ago, some of the co-operative societies in the red soil areas used to keep a supply, but the prices went up suddenly during the War and it is now beyond the reach of the ordinary cultivator.

19772. *Professor Gangulee:* Was there any suggestion at any time before Government to stop export ?—About six or seven months ago we strongly brought it to the notice of the Government that the export of bonemeal should be prohibited.

19773. Was any action taken by Government ?—I do not know.

19774. Besides this work of manure and seed distribution, are there any other points of contact between your department and the Agricultural Department ? For instance, do you participate in their propaganda work or do they participate in yours ?—I do not think either of us has got sufficient staff to participate in each other's propaganda, but we do help them sometimes in propaganda work; and sometimes their officer suggests that a co-operative society should be started. In this way, we do mutually help each other.

19775. Do you occasionally meet round a table and discuss matters ?—Very often we do that.

19776. What about industrial societies ? Are there many of them here ?—Yes.

19777. How many ?—About 400 or 500.

19778. How do they work ?—The main idea is to supply raw materials and take over the finished products.

19779. Do they get any assistance from the Industrial Department ?—Yes.

19780. Are there any cattle insurance societies ?—I would not risk one unless there was Government backing behind; the cattle are not looked after properly.

19781. Under the heading of Research, you say, "there should be an all-India Research Board to co-ordinate the activities of the various Governments and to prevent overlapping." Have you any specific instances of research overlapping ?—I cannot tell you, but overlapping often happens.

19782. You make this statement without any specific instance of overlapping in your mind ?—I cannot tell you at the present moment, of any overlapping.

19783. On page 127, you suggest the levy of a small export duty on goods going out of this country. Have you any particular commodity in mind ?—Wheat.

19784. You would prefer to put on a small export cess ?—Yes; it may also be imposed on oil-seeds and other things.

19785. *Sir Ganga Ram:* Did you say that a cess should be levied on wheat exported ?—Yes, exported from India.

19786. Exported from Calcutta ?—Generally speaking, exported from India.

19787. *Professor Gangulee :* Would you like an export cess on paddy ?—Yes. Some method must be found out for raising the money. If Government cannot provide adequate funds for research, it is my suggestion that there is a possibility in that direction.

19788. With regard to Agricultural Education, you state that the administration of such schools as may be started should be in the hands of local bodies, and the managing committees should include representatives from rural areas. Have you any experience of such schools being managed by local bodies ?—At present all the schools are managed by District Boards.

19789. Have you yourself visited any of these schools ?—I have visited them in the course of my tours.

19790. Do you think they are running successfully or efficiently ?—I have not studied the question from that point of view ; my own impression is that it is capable of improvement in many directions.

19791. In these schools, do they teach co-operative principles ?—Not much.

19792. In the adult schools to which you refer, is there any arrangement for teaching co-operative principles ?—Yes, when it is run by co-operative societies.

19793. But, when it is organised by the Agricultural Department ?—I do not know of any instance where the Agricultural Department has run an adult school.

19794. You have stated here that the primary schools will be financed out of the profits made by co-operative societies ?—That is a scheme under consideration ; it has been discussed with co-operative societies.

19795. So you have a scheme under consideration ; I want to know what portion of the profit you would allot for the purpose ?—It will require to be more than what can be allotted under the Co-operative Societies Act ; we shall have to ask for the special sanction of Government to exempt such societies from the operation of that section.

19796. Are there any cases where the profits accruing from co-operative societies are being used in that manner ?—Plenty of them.

19797. But that portion is not enough ?—It is not enough ; under my scheme it would be different.

19798. At the present moment it is quite workable ?—It is quite workable ; they make small grants out of the proceeds.

19799. *Mr. Calvert :* On this last question of Professor Gangulee's, is not the proper body to provide primary education the Local Board or the District Board ?—Yes.

19800. Are you not under the new scheme you mention, rather penalising your societies by making them pay for a school for which the Local Board is responsible ?—As a matter of fact, under that scheme, it is quite possible that the co-operative societies might like to manage the entire thing themselves. I am referring to ordinary education ; it is quite possible, as I have said, in connection with the scheme under consideration that the co-operative societies themselves would like to manage the whole show ; they will not require any assistance either from the District Boards or from Government. That is the scheme which is being discussed with co-operative societies.

19801. Is that because the villager does not like the Government system of education ?—In what way ?

19802. Because there is a rigid curriculum ?—They do not like the curriculum, and they do not like to pay the fees ; under the scheme which I have in view they will not be required to pay any fees.

19803. Is not primary education free ?—No.

19804. What are the relations between you and the Education Department ? Do you formulate any schemes in conjunction with them ?—No.

19805. Do you not think they could help you with the adult schools ?—No.

19806. Do they themselves organise co-operative societies among the teachers? —I do not think they organise any, but the teachers sometimes organise themselves into co-operative societies.

19807. Is not the Education Department actively assisting you ?—There is not much point of contact between us except in the matter of giving grants to educational institutions.

19808. Do they invite you for lectures in the training colleges ?—Sometimes my officers do lecture on their invitation.

19809. Practically, the Education Department is not throwing its weight on the side of co-operation actively ?—No. I would not advertise the co-operative movement too much, because even now you cannot cope with the demand which has been created. If you want to expand the movement, and have not got sufficient staff, then you will do more harm to the movement than good.

19810. On the question of Agricultural Indebtedness, you say that when there is a rise in the price of jute, the standard of living goes up; that is to say, borrowing is very largely due to prosperity ?—I do not exactly mean that; what I mean is that when the prices of jute, go down, they find it very difficult to reduce their standard of living. It is the uncertainty of the jute price which creates a gambling instinct. They sow the crop thinking that possibly they will get good prices; they cannot anticipate their income, and when the crop is ready they do not get proper prices; I think the prices ought to be on a more stable basis.

19811. In the world of commerce, when business is brisk, the banks find it hard to meet the demands for loans ?—Yes.

19812. That means large borrowings; I thought perhaps you were referring to a similar phenomenon in the rural areas ?—I am not referring to that phenomenon.

19813. You also refer, among the reasons preventing repayment, to the fabrication of accounts. Do you find that wrong account keeping by moneylenders is a very serious cause of debt ?—I cannot say it is a very serious cause; it is undoubtedly one of the causes.

19814. Then you rather hesitate to support the application of the Usurious Loans Act ?—Yes, because it can be evaded; probably it will increase litigation.

19815. Do you know of any example of rural debt on a large scale being relieved from the savings of agriculture ?—I can tell you that Eastern Bengal got rid of a good portion of its rural debt last year when the prices of jute rose phenomenally; many of the ryots paid even their time-barred debts.

19816. Was that shown in a reduction of current debt ?—I do not think it is shown in that direction, because it happened towards the end of the year. This year, they have been badly hit; the prices of jute have dropped down suddenly, and the price obtained is not enough to cover the cost of cultivation.

19817. You think there was reduction of debt ?—There was a substantial reduction last year.

19818. Will it be 5 per cent.?—I should put it at more than 5 per cent.

19819. You have no estimate of the total rural debt in the Province ?—No. I put the total rural debt at about 60 crores, it is my own estimate.

19820. Is it based on any investigation ?—Judging from investigations made by the Settlement Department and other departments, I estimate the total debt of Bengal as Rs. 60,00,00,000.

19821. That is by guesswork ?—More or less, but not entirely; it is based on certain figures.

19822. Only 60 crores ?—Yes.

19823. We were told the mortgage debt in Madras was 90 crores, and you have about the same population ?—My estimate may be wrong, but that is my view.

19824. You do not advocate measures to restrict or control the cultivator's credit ?—No.

19825. Does that apply generally ?—Not to backward tribes like the Santals and the hillmen.

19826. Even if you saw the credit being abused to enable the cultivators to buy drink?—That does not happen with the Bengal cultivator but it does with the Santals and hillmen. I have seen instances of it with the hillmen.

19827. Have you been able to gain any information which would suggest that one of the causes of increasing debt is the increased amount of capital in the possession of moneylenders ?—I have seen instances where an influx of capital amongst moneylenders has led to increased borrowing on the part of cultivators.

19828. Is it your opinion that rural debt is decreasing or increasing in this Presidency ?—I think it is more or less stationary.

19829. *Professor Gangulee :* In all districts ?—Not in all districts. In the Midnapore district, I think it is increasing, owing to the smaller outturn of agricultural produce.

19830. *Mr. Calvert* : One of the difficulties in the way of setting up spare-time industries is the marketing of the product ?—To a certain extent that is a difficulty.

19831. That difficulty only arises, of course, when the article produced is not consumed at home ?—Yes.

19832. If the article produced were consumed at home, that difficulty would disappear?—The only difficulty would be if the raw material was not easy to procure.

19833. If you could set up activities for the betterment of the village there would be no question of marketing at all ?—No.

19834. Do you think the time will come when you will be able to organise the spare labour of the village for the improvement of village roads and bridges, water-supply, sanitation and so on ?—I think it might be possible in time.

19835. On page 134 you say there is no need for study into possible village industries ?—We have too many studies ; the time has come for action. There are too many pamphlets, books and inquiries ; the time has come for definite action.

19836. If you have all the information required, what is the obstacle to progress ?—I cannot answer that question. You had better ask someone else.

19837. On this question of a surplus of labour, apparently there is a surplus of labour in Bengal, yet I notice the taxi-drivers here are nearly all Punjabis from the rural tracts. What is the obstacle which prevents your spare rural labour from finding employment in taxi-driving ?—I do not know ; I suppose they do not care for the allurements of city life.

19838. *Professor Gangulee :* And the country boatmen come from Bihar ?—Not all of them.

19839. *Mr. Calvert :* With regard to co-operation, you say that non-official agencies should be encouraged by every possible means. What means are you thinking of ?—If there is a recognised non-official agency it should be given grants and assistance.

19840. Financial assistance ?—Yes.

19841. The old tale of giving public money to private bodies ?—In return for doing public work.

19842. What kind of education do your audit and inspecting staff receive ?—All the Inspectors must be graduates.

19843. In economics ?—Not necessarily, but graduates in economics are given preference. For auditors, in the case of direct recruitment we insist that they shall have at least passed the Intermediate standard, but in the case of those promoted from Supervisors we do not insist on any educational qualifications ; if we find they have done good work we appoint them.

19844. Do you give them any special education ?—We place them under competent inspectors, and so they get their training, and we have a system of departmental examinations. Recently the Bengal Co-operative Organisation Society has taken up the opening of training classes.

19845. Do they themselves undergo any regular course of lectures on rural economics ?—No.

19846. And they are not examined on rural economics ?—Yes, that is a subject in the departmental examination.

19847. They are taught the Acts, by-laws and rules, I suppose ?—Yes.

19848. To what extent do you think your members of primary societies understand the principles of co-operation ?—I think to a large extent they do understand them. They know their duties and their rights, and that they can elect their panchayats or send them away. They know their relations with the Central Bank, and they attend its meetings and so on.

19849. Suppose a rich moneylender offered to remit all their debt on condition that they gave up co-operation, do you think they would agree ?—I think in some cases they have done. In some cases rich moneylenders have taken them away from co-operative societies ; in other cases they have resisted.

19850. Have any members of your staff been on deputation to Europe to study co-operation there ?—No.

19851. Are they sent to other Provinces to study ?—Regularly, yes.

19852. Do you have any system of refresher courses to enable the staff to keep up their educational standard ?—No.

19853. Who audits your Provincial Bank ?—A chartered accountant.

19854. Paid by the Provincial Bank itself ?—Yes.

19855. Does he also try to educate your other auditors in audit work ?—I think our auditors are much more efficient for the purpose of auditing village societies than a chartered accountant. I would not accept an audit of village societies by a chartered accountant. Their audit is not so detailed as ours, and they are not in a position to value the assets.

19856. I do not quite understand why the audit fund is not being more completely used for audit staff ?—I think there is a difference between the system in the Punjab and that in Bengal. Here the auditors are Government officers. The contributions of the societies go to Government, and Government sanctions the staff as if it was an ordinary staff.

19857. Your Provincial Co-operative Organisation Society does not control your audit fund ?—No.

19858. Do you think it would be a good thing if the fund were transferred to the central organisation ?—I would wait some time before doing that. The societies themselves are unwilling that the fund should be transferred, and the central organisation is also unwilling to take over the audit at this stage.

19859. What do you do with the reserves of primary societies ?—They are supposed to be separately invested in a Central Bank, and the Central Bank is supposed to put them in the Provincial Bank. Some of the primary societies are reluctant to invest their reserve fund separately.

19860. In spite of the complete failure of that system in another Province, you still adhere to it ?—Many of our primary societies are already keeping their reserves here.

19861. What is your objection to the primary society using its reserve in its own business? —I do not think that would be good business. It is not good business practice to mix up your reserves in your business. If there is a small deposit maturing and the reserve is available, they may draw from the reserve to pay it.

19862. Do you not think the members of your primary societies lose the educational value of managing their own reserve in that way ?—I do not think so. I think it is a better system to have the reserve separately invested, and is a better means of educating the primary societies in the benefits of a reserve than by keeping it mixed up in the business.

19863. Is it not purely a paper transaction ? You transfer Rs. 1,000 to the Central Bank as the reserve, and then have to borrow Rs. 1,000 to fill up the gap ?—No ; that is not it. At the end of each year you find out what your reserve is and send it to the bank. The borrowing comes later on.

19864. It is only a paper entry, all the same ?—I do not look on it in that way ; I think it has great educational value in impressing on the people that they have got together this reserve fund.

19865. A society takes 1,000 silver rupees to the Central Bank and says " This is my reserve fund " ; the Central Bank puts it into its coffers and stirs it round, and then the primary society says " I want a loan of Rs. 1,000 " and it hands it back ?—There is a difference in the rate of interest. In the case of the reserve fund they get only 3 per cent from the Central Bank, and the Central Bank has to keep it with the Provincial Bank. If you deposited Rs. 1,000 at 10 per cent and borrowed Rs. 1,000 at 10 per cent that might be a paper transaction, but not otherwise. I have very definite views on this subject.

19866. It may be the actual silver rupees are the same as were paid in by the society ? —What happens with the other system ? Everyone is taking loans from the reserve fund, and a time may come when they say they will repay their ordinary loans but will not repay the reserve fund. I think from the educational point of view the other system is much better.

19867. On this question of the delay between an application by an individual member for a loan and the payment of the loan to him, have you any system here of fixing the maximum credit of primary societies?—I do not believe in it and would never do it. There is no such system.

19868. *Professor Gangulee :* You do not believe in it ?—I object strongly to the system.

19869. Why ?—When a Registrar fixes the maximum credit, he declares to the people that in his opinion the society is solvent for that amount. Why should I undertake to guarantee the solvency of primary societies ?

19870. *Mr. Calvert:* Why should not primary societies fix their own maximum ?—They do.

19871. By formal resolution ?—Yes.

19872. Do they pass it on to the Central Bank ?—Yes.

19873. Does the Central Bank then formally fix the maximum credit for that society ?—Sometimes it does, and sometimes it does not. When there is an application for a loan they inquire into their past transactions; they have some knowledge of the society, and they sanction the loan. Sometimes they send out their officers to make inquiries. The ideal system would be the cash-credit system.

19874. For A class societies ?—For A and B, and gradually to raise the C class to the A class.

19875. Your Central Banks are comparatively small ?—Comparatively.

19876. Small area and small capital ?—Some of them have a large capital.

19877. They do not assess in general meeting the maximum credit of an individual primary society ?—No.

19878. Then you talk of giving members of a society cheques on a Central Bank. How can an individual member deal direct with a Central Bank ?—If a village committee sanctions a loan to a member of Rs. 50 and the village society has no funds, they give him a cheque and he cashes it; possibly he will be able to cash it in the village.

19879. The member of the primary society himself goes to the Central Bank to cash the cheque and the primary society does not handle the money ?—That is so.

19880. Is not that the very system which smashed things up in another Province ?—I do not think so. The society grants the loan.

19881. But it does not handle the cash ?—Ordinarily it would, but if at a particular moment it has no funds available and cannot send a man, it would give its member a cheque. I do not say a society should not handle cash; it must; I am referring to a loan granted in an emergency.

19882. That is the system which came to grief in the Central Provinces ?—I do not think so. The system there was that the society never handled the cash. I am only referring to the case of an emergency loan. I think you have misunderstood me.

19883. Are you satisfied that the repayments of loans to primary societies are made in cash ?—Yes.

19884. They are not met from borrowings ?—No.

19885 Have you any system here of group secretaries ?—No. I do not believe in that system.

19886. Each individual society has its own separate secretary, who may or may not be a member ?—In 99 per cent of cases, he is a member.

19887. You can get literate secretaries in each village ?—Yes.

19888. What is the chief object of these milk societies round Calcutta ?—To collect the members' milk and sell it at a profitable rate. It is a producers' society, not a consumers'.

19889. From popular accounts one gathers the main object is to provide Calcutta with a pure milk-supply ?—That is a wrong idea. Incidentally it solves Calcutta's milk problem, but it is really a producers' society.

19890. The main object is the benefit of the individual producer whose average daily sale of milk is very small ?—Yes.

19891. About 1½ seers ?—Yes.

19892. Where you have co-operative seed distribution, do the costs of the distribution fall on the co-operative society ?—Yes.

19893. Where Government distributes the seed, the costs of distribution are paid by Government ?—That is one of the obstacles to the fuller use of co-operative societies for the distribution of seed.

19894. Have you any concrete evidence which indicates that any legislative restriction of credit, such as the Usurious Loans Act, has actually forced up the rate of interest on

moneylenders' loans ?—I have concrete evidence that sometimes the restriction on the sale of ryots' holdings makes credit very dear to them.

19895. Actually has the passing of the Usurious Loans Act been followed by a rise in the rate of interest charged by moneylenders ?—I do not think so ; I have no experience of that.

19896. To what extent in this Presidency does the cultivator borrow money from the landlord ?—Some small landlords do resort to moneylending, and in some cases the agents of landlords also. The system does obtain, but it is not widely prevalent.

19897. *Professor Gangulee :* What about the big landlords ?—I think their agents might do it, but the big landlords themselves do not do it as a rule.

19898. You do not know of any case ?—I know of one instance ; Sir Rabindranath Tagore tried to introduce a system of land banks on his estate.

19899. Do you know the rate of interest of his bank ?—No. I think it was you who managed it.

19900. *Mr. Gupta :* Was that to help the ryots ?—Yes, that was the main idea.

19901. *Mr. Calvert :* Have you found any evidence to indicate that the landlord advances loans in order to maintain a hold on his tenant ?—It is the other way about. It is the moneylender who tries to secure the interest of the landlords in order to get a greater hold on the tenant.

19902. The moneylenders ?—It is the moneylenders sometimes who try to become landlords in order to get a greater grip over the tenants, and this is a particular phenomenon noticeable in the district of Dacca.

19903. Does your moneylending landlord also lend money in order to get a better grip on his tenants ?—I think mostly the idea is to get a better return for the money and incidentally to get a grip.

19904. And some control over his produce ?—Yes.

19905. In your experience have you found that the acceptance of a *taccavi* loan does prevent a man from getting a loan from his moneylender ?—I do not think in our Province the *taccavi* loan is taken very seriously. Nobody thinks of a *taccavi* loan. If some people in time of scarcity want a few rupees they go to the Collector. I do not think the acceptance of the *taccavi* loan has any effect on the moneylenders.

19906. Are your staff as a whole drawn from the same class as the members of the primary societies ?—A large part of our staff is drawn from the same class as members of village societies.

19907. If they stay the night in a village, they would find no caste difficulty in living and feeding with the actual members ?—No.

19908. *Mr. Kamat :* Regarding this delay in primary societies for members to obtain loans after loan applications, your experience is the same as in my Province. Have you thought of devising any means to minimise the delay ?—We have, as I said, introduced or are trying to introduce the system of cash credit and also we are trying to press upon the Central Banks to dispose of their loan applications as promptly as possible and we have also suggested that the Board of Directors should have a small committee to deal promptly with loan applications. I think the delays are being minimised as far as possible.

19909. Have you got in this Presidency agricultural purchase societies in large numbers ?—Not in large numbers. We have got a few.

19910. What is the reason ?—Partly we are understaffed and we are not able to do that propaganda which is necessary and partly we had found out by experience that a purchase society in order to pay its overhead charges must be started on a very big scale.

19911. In your Provincial Bank, have you got large funds available as depsoits ?—We have got no difficulty about funds.

19912. There is no difficulty in this Presidency about funds ?—Not the slightest. Our difficulty, as I said, is to invest our surplus.

19913. About Agricultural Implements, you have said in one place that your difficulty is that there are very few improved agricultural implements which can be brought into use by the agriculturists ; will you kindly explain that ?—Well, the agriculturists do not know and we cannot recommend to them the use of any improved agricultural implement by the use of which they can save money of get an increased return. For instance,

I persuaded one society to make an experiment with tractors. They spent a lot of money in making the experiment and then they found it did not succeed.

19914. That is with reference to tractors. What about other implements ?—I do not know of any. Unfortunately I am ignorant of agricultural matters and I do not know of any implements which could be popularised and used.

19915. *Professor Gangulee :* What about iron ploughs ?—I do not think our bullocks will stand them or that the land requires them. I do not think the land is so difficult to till here.

19916. *Mr. Kamat :* So on account of this difficulty you are losing in this Presidency one source of agricultural improvement attainable by the use of improved implements ?—Yes.

19917. This difficulty can be met if you have an Agricultural Engineer ?—If he can devise implements, yes.

19918. You have no Agricultural Engineer as such now ?—No.

19919. Whether attached to your department or any other department ?—No.

19920. And that is a great handicap, I suppose ?—I suppose so.

19921. You once had an Agricultural Engineer in your department ?—Yes, to assist minor irrigation works.

19922. Only irrigation work, and he had nothing to do with agricultural implements ?—No ; he had no time to devote his attention to agricultural implements. His hands were full.

19923. With irrigation matters ?—Yes.

19924. I should like to know something about marketing with reference to the note appended to your statement, especially with reference to jute marketing. There are something like five middlemen, you say. Have you got a jute producers' society ?—Yes ; we are starting jute producers' societies.

19925. You are starting or have started ?—We have got about five of them in full working. This year we have sold 20 lakhs worth of jute.

19926. Have you tried to minimise these middlemen by your co-operative movement ?—That is our aim, and with that aim we have started these societies.

19927. How many middlemen can you cut out ?—We have cut out in some places a lot of them and in some places we have cut out one or two of them. We cannot make a general statement. It is in an experimental stage. I should say we have made an excellent beginning, and I am very hopeful.

19928. *Professor Gangulee :* Do you meet with any opposition from vested interests to any great extent ?—Vested interests, of course, do not like to see any competitors. It is natural that vested interests should oppose.

19929. *Mr. Kamat :* That is only a general statement. Now can you give me an idea of what is roughly the amount which the jute producer actually gets, I mean which actually goes into his pocket, as against the prevailing price of jute for the time being? What is the difference ?—The difference varies in various places. If you want to go on the basis of average I put the difference at about Rs. 2-8 per maund.

19930. That is to say, roughly he gets Rs. 2-8 less per maund than he should get ?—Yes. Actually the middlemen make more ; but that is the net loss to him.

19931. What is the average price per maund of jute, the market price on which you are working ?—Of course there are different classes of jute. Just at present the very lowest quality sells at Rs. 3 and here in Calcutta it will sell at Rs. 5-4.

19932. *Sir Ganga Ram :* Out of which the middlemen take Rs. 2-4 ?—Rs. 3 is the price which you can get in the jute centre. The cultivator gets about Rs. 2.

19933. *Mr. Kamat :* Out of Rs. 3 he gets Rs. 2, and it is sold in Calcutta at Rs. 5-4 ?—Yes.

19934. So in percentage he gets two-thirds the usual price ?—Yes.

19935. He loses 33 per cent ?—Well, in the case of higher grades of jute he does not lose so much. I put it at 25 per cent. He loses 25 per cent of the price.

19936. Now have you any idea roughly how many thousands or lakhs of bales of jute you export from this Presidency ?—Yes. This year I think, the trade demand for export is 40 lakhs of bales as against the local consumption of 60 lakhs.

19937. Valued roughly at ?—The average price I should take to be about Rs. 7 per maund.

19938. Price per bale I am asking ?—The bale contains about 3½ maunds.

19939. *Professor Gangulee :* If we value each bale at Rs. 20 perhaps it will make it easier to calculate ?—Yes.

19940. *Mr. Kamat :* One-third of it is lost to the producer ?—One-fourth, I should say.

19941. *Sir Ganga Ram :* Is not a bale of 400 lbs ?—I was dealing with the bales consumed in the Calcutta mills. For export I think it is 5 maunds, baled under very high pressure.

19942. *Mr. Kamat :* So that the loss is so serious even from one crop that the problem requires very close investigation ?—Yes.

19943. *Rai Bahadur Bannerji :* In connection with this central anti-malaria movement set on foot by Rai Bahadur Dr. Gopal Chandra Chatterjee, you have told us you have stopped registering these until you get a declaration of policy by Government ?—Yes.

19944. Will not that mean a set-back to this anti-malaria movement ?—I do not think so. I am registering it in Calcutta, in the district of 24-Parganas and in the surrounding districts, but not in outlying districts with which the anti-malaria society is not much in touch.

19945. So you are not registering them because your department is not in close touch with these societies ?—I am not registering because I do not think the anti-malaria society is in the position of being in close touch with them.

19946. But cannot your department be easily in touch with them as it is with the other societies ?—Unfortunately my departmental staff is too much overworked.

19947. If your staff be increased you will be quite in a position to register these societies as before ?—Yes.

19948. There has been an idea in the country that these mofussil anti-malarial societies might be replaced by the Union Boards taking up the work ?—Some very influential people whom I have met think so.

19949. Are they officials or non-officials ?—Both officials and non-officials.

19950. Are these Union Boards in a position to do such work as some of these anti-malaria societies are doing ?—For intensive work in the village I do not think the Union Board is in a position to do it, while co-operative anti-malaria societies are in an excellent position ; but for general supervision and for keeping up a continued interest in sanitation I think the Union Boards are the best agents.

19951. *Professor Gangulee :* The Union Boards do not take an interest in Dr. Chatterjee's movement ?—Some of the Union Boards do not and some Union Boards do. Government ought to investigate the matter and come to a definite understanding with the central anti-malaria society as to the assistance they can render. Even Rai Bahadur Dr. Gopal Chandra Chatterjee has written to me that his society should be relieved from organisation work because Government has cut out the grant. I have gone into the matter and I have been pressing for the last six months for a declaration of policy and the convening of a small conference, but without any result.

19952. *Rai Bahadur Bannerji :* Government have not declared any policy ?—They have not declared any policy.

19953. Do you think it should be done at once ?—It should be done at once, because I say that Rai Bahadur Dr. Gopal Chandra Chatterjee has been successful in a pre-eminent degree in rousing the interest of the people in rural sanitation. It may not commend itself to some but at any rate popular enthusiasm in sanitation has been created.

19954. *Professor Gangulee :* And you have drawn Dr. Bentley's attention to this problem ?—On several occasions I have drawn the attention of Government to it and pressed for a conference.

19955. Did you personally meet Dr. Bentley ?—He has just returned. His *locum tenens* did not favour these societies at all. There must be continuity of policy. If Dr. Bentley goes away and his successor comes he may say 'I do not want these societies.' There is no continuity of policy and I think the blame is entirely on the Government.

19956. *Mr. Gupta :* Are you referring to Major Stuart ?—I am not referring to anybody.

19957. He recommended something so far as I know ?—He did not recommend to Government the same treatment to societies as Dr. Bentley recommended.

19958. He did not want a block grant to be made ?—He recommended payment on the results of each society.

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19959. *Rai Bahadur Bannerji:* Now, as regards this irrigation by tanks and small streams, especially in Western Bengal, in Bankura, Midnapore and all these districts, has not the custom already been prevailing in the country that people have been taking water from these streams ? Of course there is no question of tanks. But even from the streams people have been in the habit of taking water for irrigation from time immemorial?—Quite right.

19960. And they have been taking it with the help of *kutcha* earthen weirs and having the necessary channels ?—Yes.

19961. What the Co-operative Department has been doing is to try and give these schemes of irrigation a permanent basis by the formation of co-operative irrigation societies to construct masonry weirs and better channels for distribution of water. In Western Bengal, usually these streams belong to the zamindars; is that not the case ?—Yes, all these streams belong to the zamindars.

19962. All of them ?—Yes.

19963. And the zamindars do not object to water being taken for the benefit of cultivation ?—They do not object.

19964. In the formation of co-operative societies for tank and stream irrigation schemes, it is generally found that although a large majority are willing to co-operate, there are one or two who do not, and on account of that it is not possible to form a society ?—Yes.

19965. Do you think that legislation to compel this minority to join the scheme is necessary ?—Legislation is necessary on the lines I have suggested in my statement. They should not be compelled to join co-operative societies as members, nor should the co-operative societies be compelled to take them as members. But some measure to compel them to contribute towards the cost should be devised.

19966. It has been found in practice that when these small irrigation societies are formed you have to take the help of Government engineers. In Bankura and Birbhum you have irrigation sub-divisional officers. Although in Bankura he is called an Agricultural Engineer, it is a misnomer to call him so ?—He is no longer called Agricultural Engineer.

19967. The plans of these Sub-divisional Officers have to be submitted to the Superintending Engineer and perhaps to the Chief Engineer for Irrigation and all this takes a long time, and they have to change their plans and estimates very often ?—Yes, very often.

19968. What other course do you think will be most suitable for expediting the construction of these schemes ?—The employment of a whole-time irrigational officer under the Co-operative Department.

19969. *Mr. Gupta:* Why under the Co-operative Department ?—Because we deal entirely with co-operative irrigation societies. We can ask him to take up these schemes and go on with the work without waiting.

19970. If many schemes are on the anvil ?—We shall have a special officer.

19971. You will have two ?—Yes, two. Even if you employ ten engineers, the Co-operative Department can give them full work; there is so much scope.

19972. *Rai Bahadur Bannerji:* In that case you think there will be no delay as now ?—There ought not to be any delay.

19973. You have generally conferences with Irrigation Engineers and you draw up proposals to be adopted. Are they put into effect ?—Not generally, I am sorry to say.

19974. In the district of Birbhum this irrigation movement was set on foot, properly speaking, at the time whem Mr. G. S. Dutt was District Officer. His policy was followed enthusiastically by Mr. J. R. Blackwood in his term of office, and it is being followed equally enthusiastically at the present moment by Mr. Quinton, the present District Officer ?—That is so. I think Mr. A. C. Bannerji, when he was Chairman of the District Board, did much for irrigation.

19975. You have stated in the course of your evidence that the village societies borrow at the rate of 9¾ per cent ?—Yes.

19976. And they lend at 12½ per cent ?—That is in the Western Division.

19977. Is a reduction in the rate of interest possible ?—I do not think it is possible until we are able to raise money much more cheaply. I do not like to cheapen the rates of interest until the people are educated to a full understanding of the principles of the movement. Cheap credit is a double-edged weapon.

19978. *Mr. Calvert :* Can you not use your reserves ?—We might thereby reduce the rates by one or two per cent but I think in keeping the reserve separate we keep it safe. It is more likely that we shall be able to reduce our rates sooner under my system than we can under your system.

19979. *Rai Bahadur Bannerji :* In Western Bengal the village *mahajans* have reduced their rate of interest on land mortgage to 8 per cent ?—I think there has been a general reduction of the rate of interest charged by the moneylenders on account of the co-operative movement not only in Western Bengal but throughout the Presidency.

19980. Should not the co-operative societies think now of devising methods to reduce their rates of interest ?—They might. As a matter of fact they have reduced their rate of interest this year on short-term loans. On short-term loans they are charging 12 per cent and not 12½ per cent ; in Eastern Bengal they have reduced it from 15 to 12½. So that this year there has been a reduction in one class of loans.

19981. *Sir Ganga Ram :* Do you control marketing at all ?—I do not control the markets ; I look after co-operative societies.

19982. Are these societies limited companies ?—No. They are not registered under the Joint Stock Companies Act ; they are registered under the Co-operative Societies Act.

19983. Have they any status ?—Yes ; they have.

19984. Can they compel people to join a society ? Supposing one producer refuses to join, can you compel him ?—No. Those producers who want to form themselves into a society apply to us to be registered as a society and we register them as a society.

19985. There is no compulsion ?—There is no compulsion.

19986. I am not quite satisfied with your answer about the sale of jute. You said that the agent sold to the middleman ?—The agents sell to the Calcutta mills through the brokers ; the Calcutta mills do not buy direct from the agents.

19987. Do you or your office get daily telegrams of the world rates for jute ?—No ; the agent is supposed to get them.

19988. Does the agent get them ?—He keeps all the information he thinks he ought to keep.

19989. You have no control over him ?—I have no control ; I do not want any control.

19990. On whose account is the jute sold ?—On the society's account.

19991. Supposing the agent sells forward 2 lakhs worth of jute, will the society be responsible for carrying out that order ?—Yes.

19992. Supposing he is in collusion with the brokers ?—The society itself is responsible for it. Why did they appoint him ?

19993. A very influential gentleman in Bengal came to me and said these producers were so poor that some of them, in fact the bulk of them, had got only one *dhoti* between two women ?—I do not believe that ; it is a gross exaggeration, and nothing else.

19994. Are you aware of the under-currents of speculation ?—I hear something about it.

19995. From the information I have had, I think 75 per cent goes to the middlemen and 25 per cent. only to the producer ?—That, I think, is also an exaggeration.

19996. Why should there be so many middlemen in Bengal ; they are not required in other Provinces ? In other Provinces the people take their produce to the *mandi*. Is there a *mandi* system here ?—What is a *mandi* ?

19997. Bazaar ?—Here they do take it to the bazaar.

19998. In the Punjab, Government have made a rule to put up a sort of board, over the signature of the Director of Agriculture, giving the prices ruling daily in different parts of the world, so that the producer will know the ruling rate of the day ?—In our Province sometimes the cultivator goes to the *hat* (*mandi*), where some *beparis* come and purchase their stuff. Then they take it to the baling firm, they must sell it through a broker to the baling firm.

19999. *Sir Ganga Ram :* Here the middleman is making a fortune ; your producer is simply surrounded with pests.

Mr. Gupta : I hope the Commission will remove those pests.

Sir Ganga Ram : What I have described is a true picture of the whole thing. The money goes into the hands of the speculators ; there is great room here for speculation.

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20000. *Mr. Gupta:* Did you say that the indebtedness of the agriculturists is at a standstill ?—Speaking generally of the whole Province, yes.

20001. What about the work of your own department ? Has it not helped to remove agricultural indebtedness ?—We have only touched the fringe of the problem.

20002. It cannot be stationary unless they are contracting new debts ; your department must have helped them to reduce their debts ?—We have not covered the whole field yet.

20003. But you have made some impression ?—Yes ; the fact is we have made some reduction in the rates of interest.

20004. *Sir Henry Lawrence:* You spoke of the Usurious Loans Act. Would you tell me what procedure is adopted here ?—I have not any experience of it.

20005. Is it in fact used for the protection of the ryot at all ?—I do not think much use is made of it.

20006. *The Chairman:* If I understood one of your answers aright, you occasionally refuse registration to those who are applying to be registered as a society on the ground that you have not sufficient staff to carry out supervision ?—On the ground that they have not been properly organised, and I cannot send a person to organise them. It is organised by private persons, and I have no certainty that it will continue to work well or that it will not change its co-operative character. I must see to two things : that they are co-operative and are likely to succeed, and that they will retain their co-operative character.

20007. I asked whether you ever refused registration on the ground that you have not sufficient staff to carry out adequate supervision ?—I have often asked organisers not to organise societies ; I have not actually refused them registration on the ground that I have not sufficient staff to supervise.

20008. Would you be within your powers as defined in the Act if you declined registration on that ground ?—I would be absolutely within my power. I have to be quite sure that it will succeed.

20009. I want to be quite certain. Is it within your power, under the Act, to refuse registration on the ground that you have not sufficient staff to carry out adequate supervision ?—I have never refused registration on that ground. As a matter of fact, I have absolute discretion to register or not to register societies. That is the whole foundation of the Act.

20010. *Sir Henry Lawrence:* Without alleging any reason ?—I think under the rules we have got to allege reasons.

The Chairman: I think that is almost certain to be the case.

(The witness withdrew.)

Khan Bahadur MAULVI HEMAYAT UDDIN AHMED, Pleader, Barisal (Bengal)

Replies to the Questionnaire

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(*a*) I am not aware of any improvement in the practice of cultivators in the district of Backergunj which is considered to be the granary of Bengal.

(*b*) If demonstrations are made economically within the means of common cultivator showing a fair margin of profit, it will then and then only be effective and attractive.

(*c*) The cultivators are not inclined to avail themselves of expert advice as they find the method suggested is too expensive for them and that the demonstration farms in their charge are not generally even self-supporting, not to speak of being remunerative. So if these firms are so managed as to prove a remunerative concern, then the cultivators will be inclined to follow it and to take the advice of its manager.

QUESTION 5.—FINANCE.—(*a*) Extensive and intensive propaganda for establishing rural co-operative societies.

(*b*) Government system of *taccavi* is not at all popular in this district and I do not think it can be improved under the present condition.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(*a*) (*i*) Want of education and consequent forethought, extravagance, idleness, social rigidity in matters of religious and social rites and the last but not the least the high rate of interest as well as the illegal and arbitrary exactions of the zamindars.

(*ii*) *Mahajans*, co-operative credit societies and Government loan.

(*iii*) (1) Limited income coupled with the bad intention of the *mahajans* to get hold of his holding.

(2) Want of thrift. (3) Failure of crops (4) Sudden fall of the price of the agricultural produce.

(*b*) The application of the Usurious Loans Act seems to be the best measure in my opinion.

(*c*) I am not in favour of any restriction or control of the cultivators' credit.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—(*c*) It would be better if any inexpensive method could be introduced by legislation to deal with such persons and to keep disputes out of the courts.

QUESTION 11.—CROPS.—(*ii*) Fodder crops are very much needed in this district, so I would suggest the introduction of Guinea grass.

QUESTION 15.—VETERINARY.—(*a*) Agricultural and Veterinary Departments should be co-ordinated, the Civil Veterinary Department may be under the Director of Agriculture with an Assistant Director who is an expert in veterinary science in charge of the Veterinary Department acting under the orders of the Director of Agriculture. Absolutely independent Directors for these two allied departments, are not desirable in my opinion.

(*b*) (*i*) Yes, it is working well.

(*ii*) Certainly not. Dispensaries are generally located in the district headquarters, where the people of the neighbourhood are rather labourers than agriculturists. The agricultural population live in the villages and cattle is their principal properties and agricultural accessories. This being the case, dispensaries in the interior or at least at each *thana* quarter are more needed than those at the district headquarters. So long as these dispensaries are not within the easy reach of the agricultural population, no appreciable good can be done to the people.

(*iii*) I think the Provincial Government is at present the controlling authority.

(*c*) (*i*) The agriculturist cannot make full use of the dispensaries for the reasons given in my reply to Question 15 (*b*) (*ii*) and the remedies are also suggested therein.

(*ii*) There is no touring dispensary in this district. The doctors in charge of dispensaries make tours in the villages for a certain number of days in the month which is not an adequate arrangement and the people cannot make full use of it.

(*d*) Paucity of doctors, ignorance and consequent indifference of the people, want of timely information, absence of *bhagar* (fixed place for the disposal of deceased carcasses) are among the principal obstacles. I do not advocate legislation unless and until a sufficient proportion of the agriculturists understand the importance of segregation, inoculation, etc. If a fixed place in every village be allotted for the disposal of deceased carcasses and the people of the village be bound by the bye-laws of Union Boards to dispose of the carcasses there, on some penalty, the chief cause of the spread of epidemics may be combated. Other things in this connection may be dealt with by ordinary law as far as possible. In the present condition of the country, I do not consider that it is practicable to do more than this.

K. B. Maulvi Hemayat Uddin Ahmed.

(*e*) There is difficulty in securing sufficient serum in time but the difficulty may be overcome by the construction of serum-cellar in every district.

(*f*) Short period of immunisation is the principal obstacle which should by all means be increased by scientific measures. No fee is charged.

(*g*) Yes.

(*i*) No.

(*ii*) I advocate extension, so that the veterinary graduates may get sufficient training in bacteriological diagnoses, to enable them to do on the spot microscopic examinations.

(*h*) (*i*) No.

(*ii*) Yes.

(*iii*) I see no necessity for such an officer.

QUESTION 16.—ANIMAL HUSBANDRY.—(*i*) Improving the breeds of livestock is very much needed in this district and for this purpose I would suggest provision of better bulls in the village and spacious grazing grounds. Insufficiency of pasture is the principal cause of the degeneration of cattle. Unless it is removed, no improvement of cattle-breeding can be expected.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(*b*) This is a jute-growing district. The agricultural population has ample spare time at their disposal. Introduction of making good gunny bags and chats would be a very suitable subsidiary industry for them.

(*d*) I would advocate establishing by Government industries connected with the preparation of agricultural produce for consumption such as sugar-making, utilisation of rice straw and betel-nut covers for paper-making in this district.

QUESTION 22.—CO-OPERATION.—(*a*) (*i*) Co-operative movement should stand on its own legs; the less the Government interference the better. The Government should not try to officialise it, but should always encourage private enterprise by (1) starting special agricultural schools for the sons of the agriculturists, (2) starting middle schools to impart the knowledge of co-operation and the principles of co-operative movement, (3) training schools and colleges for teaching book-keeping, banking and the general system of export and imports, etc., (4) by allotting sufficient money in the Budget for the appointment of supervising and auditing officers.

(*ii*) Statutory power should be given to reliable private persons to do some of the works which are now being done by the Registrar as criminal administration is entrusted to some extent to the Honorary Magistrates.

(*b*) (*i*) The co-operative movement in this district is at present almost limited to credit societies. The chief drawback is illiteracy. Compulsory free primary education is urgently needed for the expansion of such societies. Want of statutory power to call for the accounts of the creditor is keenly felt to ascertain the actual liabilities of the members. There is no speedy and effective means to realise the dues from the recalcitrant members. The attempt to control the disposal of the Reserve Fund by the Registrar is calculated to retard the progress of the movement. Unnecessary restriction which is now being introduced in the bye-laws* by the department is another cause of complaint. Societies' dues should be made the first charge after rent on the assets of the members by legislation.

(*ii*) None in the district.

(*iii*) No such society is in working condition here, but such societies are very much needed for the sale of agricultural produce such as betel-nut, paddy and jute. The principal difficulty to run such society is marketing in absence of central organisation at the exporting places. It is necessary to have warehouses at Rangoon to dispose of betel-nuts (*moghai*) and at Calcutta to export jute and paddy.

(*iv*) No such societies are needed here.

(*v*) No room here for such societies.

(*vi*) Agricultural machinery cannot be used here in marshy land.

(*vii*) There is ample room for such societies in this district if the Government shows its inclination to settle *char* lands to such societies.

(*viii*) No such society exists here and is not likely to come into existence for want of proper training and education.

(*d*) Yes. Co-operative credit societies under the Central Bank of which I am the Secretary have in most cases been very successful. Indebtedness has been very much diminished, local rate of interest has shown a downward tendency and in many places it has reached the normal condition. A spirit of joint action and sense of joint and individual responsibility are appreciably visible. Want of literacy and business habit are being

* Memorandum No. 4908, dated the 28th July 1926, issued by the Registrar of Co-operative Societies, Bengal (*q. v.*)

keenly felt and a desire to remove the former and to acquire the latter has been kindled. In short, there seems to be a new life in the village where there are some societies in good working order.

QUESTION 23.—GENERAL EDUCATION.—(*a*) The system of education which is in vogue in this country is not absolutely helpful to agricultural efficiency. It may produce a poet or novelist, a clerk or administrator, a politician or agitator but not a good business man or a model farmer. The causes for such a deplorable result are, in my opinion, to be found in the medium of instruction—English, owing to which vague ideas are received but not properly assimilated. More attention is paid to book knowledge rather than to practice.

(*i*) Collegiate education is received by the higher class people who have no concern with agriculture and therefore no provision has been made there for scientific agricultural training or education. In my opinion, if in the University there would have been a department of agriculture, the higher class people and the intelligentsia of the country would have taken some interest in agriculture.

(*ii*) Middle schools are only stepping stones to higher education. There should be a bifurcation at the lowest class, one branch leading to collegiate education and the other devoted to Agriculture, farming and other subjects of household economy.

(*iii*) The present system of primary education needs wholesale overhauling. As it exists in the country, it is rather harmful to the agricultural population. It neither increases their knowledge for the better management of their ancestral pursuit nor does it train their habit to successfully do the household work. It only kindles a desire in them to lead an easy life and creates a hatred towards manual labour. I would advocate a system of a sort of farm-school with a demonstration farm attached to it where the three R's may be taught in the class and practical training in agriculture may be given in the field.

(*b*) (*i*) Please see the above reply.

(*ii*) As Chairman of the Backarganj District Board, I started a free primary school in a certain area under Mr. Biss's scheme which acted like a sort of compulsory education. The school attracted almost all the boys of the village, but the system not being quite suitable to the condition of the life of the agriculturists, it could not develop very much. Had the system of education been what I have suggested in my reply to Question (*a*) (*iii*) above, I believe, the people could appreciate the value practically and compulsion would be quite justifiable. I am an advocate of free compulsory education provided the system be suitable to the condition of an agricultural life. The school sits either from 11 a.m. to 4 p.m. or once in the morning and again in the evening; so the poor parent loses the services of his boys even when they grow old and are able to help him. Moreover, while the parent finds that his ward is not acquiring any knowledge helpful to his avocation, his enthusiasm cools down and the boy is taken away from the school to be employed at the plough or otherwise.

Oral Evidence

20011. *The Chairman:* Khan Bahadur Hemayat Uddin Ahmed, you have provided the Commission with an interesting note of your views in answer to our Questionnaire, and we are greatly obliged to you for the trouble you have taken in the matter; the note is in the hands of my colleagues. Do you desire to make any statement of a general nature, or shall I ask you one or two questions on your note?—I would prefer to reply to questions.

20012. I see on page 169 you express the view that if demonstrations are made economically within the means of the common cultivator, the improvements demonstrated will be adopted by him?—Yes.

20013. Would you suggest making these experiments on the cultivator's own holdings?—Yes. Just at present, the demonstrations are held at the district headquarters, and the neighbouring people are labourers; they are not agriculturists. Agriculturists generally live in villages in the interior. Sometimes they try to carry out demonstrations through the cultivators, but they take to it very unwillingly.

20014. Do you not also think that the demonstrations which are held by the Agricultural Department are suspected by the cultivators? They always think that the Agricultural Department has better land than they have?—Yes, they think that the department has better land and that the department is using means not available to the cultivators, and they do not attach importance to such demonstrations at all.

20015. You think a demonstration on the cultivator's own holding is the best method?—It must be on the cultivator's own holding. Now it is done through the cultivators. I would suggest that the department should take a cultivator's land on long lease and the demonstrations should be held there.

20016. On page 169 of your note you say, "Fodder crops are very much needed in this district," and you suggest the introduction of Guinea grass. Is yours an irrigated district?—It is not.

20017. Would it be possible to grow these fodder crops there?—Yes, there is sufficient raised land on which they can be grown; an experiment is being made in that connection.

20018. Would it be grown at the sacrifice of other crops?—It could be grown on fallow lands also.

20019. You think that it can be fitted in with the present rotation?—Yes.

20020. You think that cultivators will take readily to the growing of fodder crops?—At first they will not, but when they find that it is advantageous to do it they will.

20021. Your note is very clear, and I have only one or two questions to ask you, mainly about co-operation. What experience have you of the co-operative movement?—Co-operative credit societies have now been established; people are accustomed to the system.

20022. Have you yourself much experience of these societies?—I have thirteen years experience.

20023. Are you a member of any society?—I am the Secretary of a Central Bank; I have established it and worked at it.

20024. Is it your experience that the primary societies with which you are most familiar are well managed?—Most of them are well managed.

20025. Do you think the supervision by the Central Banks is adequate?—I cannot speak for all Central Banks; in some banks there are a sufficient number of supervisors, but in others there are not. In the case of my Central Bank, I have about thirty societies under one supervisor.

20026. How many societies are attached to one Central Bank?—Three hundred just at present.

20027. For one Central Bank?—Three hundred societies. There were rather more, I think; the whole district was under my jurisdiction, but some other Central Banks have since been established, taking away the societies under my Central Bank.

20028. You provide supervisors from your Central Bank?—Yes.

20029. Are you satisfied with the services of the supervisors you provide?—I am satisfied with the supervisors under my Central Bank.

20030. How about the supervision by the department?—Audit is being done by them, but I am absolutely dissatisfied with the audit that is going on; it is not helpful to us.

20031. What is the matter with it?—It goes on throughout the year and not for a full financial year. Generally the Bengali year ends in *Chaitra* (March-April) and begins in *Baishakh* (April-May) and if the accounts for the whole year are not examined at the

beginning of the new year or at the end of the old year, but sometimes in the middle, it gives no idea of the real financial condition of the bank.

20032. If you examine the affairs of a society for any term of months, will not that give you an idea ?—It will not. If the accounts are audited before the realisations are made, how can you have an idea of it ? The two seasons when realisation is made are the jute season and the paddy season. If the society is audited then, it can be known whether the members are regular or irregular.

20033. You will have an idea what the condition of affairs of the society really is ?—Yes. Another defect of the present audit is that it is done badly. Questions are answered haphazardly ; the auditors do not get sufficient time to do it.

20034. Have you known specific instances where the audit by the department has failed to disclose improper practices on the part of the secretary of the society or any other officer ?—I cannot give you the names.

20035. Have you any specific instances to give the Commission of the failure of the official audit ? If you are not quite willing, you had better not give it at all ?—Another thing is that this year 25 societies are being audited monthly by the departmental auditors which is physically impossible.

20036. Twenty-five societies monthly, by how many auditors ?—Every auditor has to audit 25 societies a month in the Dacca Division, which is physically impossible. These societies are at different places, and what the auditors do is to finish their work at all costs. As I understand it, the audit of co-operative societies and that of chartered banks are quite different things ; in the latter case, it is only arithmetical work ; in the former case it is meant to give an exact idea of the society and how it is working.

20037. How long does it take, in your experience, properly to examine the accounts of a society ?—It is not only an examination of the accounts, but there are various questions which have to be answered by the auditors, and that requires at least three days.

I think the rest of your note is quite clear. My colleagues may have one or two questions to ask you.

20038. *Sir James MacKenna :* You say, " The Civil Veterinary Department may be under the Director of Agriculture with an Assistant Director who is expert in Veterinary". That Assistant would be a Superintendent of the Civil Veterinary Department, would he not ? He would be a veterinary officer, would he not ?—I would prefer a man of higher status to be the Assistant Director.

20039. To be under the Director of Agriculture ?—Yes.

20040. *Mr. Calvert :* You make a remark about the disposal of the reserve fund. Is it your opinion that the reserve fund of primary societies should be left in the primary society ?—We have been preaching that from the very beginning. These people do not understand the importance of a reserve fund ; so they are told at the very beginning that if a society is dissolved or comes to an end, somehow that reserve fund should be spent for the benefit of the area, according to the decision of the members of the society. But now a circular has been issued that it should be at the discretion of the Registrar of Co-operative Societies. That is quite contrary to what we have been preaching so long.

20041. Are you referring to the surplus assets after liquidation ?—There is a reserve fund separately invested, and that fund is not divisible.

20042. You object to the disposal of the reserve fund being under the control of the Registrar. Do you mean the reserve fund of a living society or the reserve fund of a defunct society ?—Of a defunct society.

20043. I am very glad to hear that indebtedness has been very much diminished. How does your Central Bank make up its mind to comply with or to refuse an application for a loan from a primary society ? If a primary society applies to you for a loan, what is the procedure ?—First, the application is examined on the spot by one of our supervisors, and he finds out whether the money is taken for a productive or an unproductive purpose ; if the greater portion of the money is taken for productive purposes, then the loan is readily granted ; if the greater portion of the loan is taken for any other purpose, then we look to the assets of the man who takes the loan. We generally give a loan to the extent of one-fifth of the real property ; when we find that the loan exceeds that and is being taken for an unproductive purpose, then we refuse to grant the loan.

20044. Does the Central Bank go into all these details ?—Yes.

20045. At your annual general meetings, you have representatives of the primary societies?—Yes.

20046. Do these representatives sit on the floor or on chairs ?—Not on chairs but on benches ; we cannot provide chairs enough for all.

20047. Do you make any distinction between the individual members and the people from primary societies ?—No ; if in the Directorate we have a representative of the village societies who is a tenant, he sits with his landlord. In my own society I have got as a member on the Directorate, Babu Kaliprosanna Chaudhuri, who is a big zamindar, and one of his tenants is also a member of the Directorate, but he comes and sits in the chair just as his landlord does ; they are both provided with chairs.

20048. You try to teach the members of the society that the Central Bank exists solely for their benefit ?—Yes.

20049. *Mr. Kamat :* About co-operation, you say, " Statutory power should be given to reliable private persons to do some of the works which are now being done by the Registrar ". What have you in mind ?—Registration of societies which, I think, is more or less mechanical.

20050. In other words, you want honorary Registrars of Co-operative Societies ?—Yes.

20051. Do you think that is a practicable proposition ?—Yes.

20052. These honorary Registrars should register any society ?—Under the law, those societies which are suitable and legal may be registered. What more the Assistant Registrars and the Registrar do I cannot understand. I understand their primary duty is to do that, and up to now I have never heard of an instance of an Assistant Registrar or the Registrar refusing to register any society.

20053. In practice, virtually, he registers every society ?—Almost all the societies.

20054. Does the Registrar go round the districts, to your knowledge ?—Yes, he goes round the districts, and I have travelled with him sometimes.

20055. *Rai Bahadur Bannerji :* You have stated that you are dissatisfied with the present system of audit ; do you mean to say it is not sufficient, or it is not efficient ?—It is neither sufficient nor efficient. To me it is nothing. I do not attach any importance to it.

20056. *Sir Henry Lawrence :* You state, " The application of the Usurious Loans Act to be the best measure in my opinion." Is the Usurious Loans Act not in force ?—No.

20057. Not in force in the Presidency at all ?—I am not aware of it.

20058. *Professor Gangulee :* It is in force, but the people do not make use of it ?—But whatever is claimed by the *mahajans* is decreed.

20059. You mean in practice ?—Yes.

20060. *Sir Henry Lawrence :* What is the procedure under which that Act should be brought into force ?—Restriction of rates of interest.

20061. Is the debtor not entitled to ask that the Act shall be applied to a particular case ?—So far as I am aware, nobody knows that it is in force, and no pleader ever advises his client to put forward such a plea.

20062. Are the people in your district principally Mahommedan ?—The majority are Mahommedans.

20063. You are the Chairman of the District Board ?—Yes.

20064. Do your Mussalmans there take interest on money lent ?—Many of them, and most of them with a vengeance.

20065. Most of them do ?—Yes.

20066. Do those that are members of co-operative societies take the interest that is due to them ?—They borrow money from the society.

20067. When a dividend is declared, do they take it ?—In rural societies dividends are not declared.

20068. None have been paying ?—None.

20069. They have no objection to taking interest ?—In the Central Bank I have two Mahommedan members who have declined to take the dividend ; they are paying it to some charitable institution.

20070. That practice of the Mussalmans in your district presents no objection or difficulty to the extension of the co-operative movement ?—In the Bhola quarter, I have more than 90 per cent. Mahommedans, and there are some Maulvis, some of whom are raising obstacles, but there are also other Maulvis who are advocating it. The Secretary of the Bhola Central Bank is a Maulvi. I have got many Maulvis as secretaries of rural societies.

20071. In regard to the Usurious Loans Act, what you wish done is that the Government should insist on Munsiffs making use of the powers they have under the Act; is that so?—Yes; even in the Small Causes Court three times the principal is decreed at present.

20072. *Professor Gangulee:* You come from Backergunj district which is called the granary of Bengal?—Yes.

20073. Have you a paddy sale society?—No.

20074. You have no paddy sale society in the whole district?—No; I tried to form one society for betel-nut, but I could not do it, because we have no warehouse at Rangoon.

20075. Did you make a proposal to the co-operative societies for organising a paddy sale society?—It is very very difficult.

(The witness withdrew.)

Mr. NAGENDRA NATH MUKHERJEE, B.L., Secretary, Ranaghat Central Co-operative Bank, Ltd., Ranaghat, Bengal

Replies to the Questionnaire

QUESTION 2 (*i*).—Practically there is no institution for imparting agricultural education. The number of teachers and institutions for the purpose are not at all sufficient. One or two institutions should be established in Bengal for the purpose of research and for imparting higher agricultural education but an attempt should be made to improve the general knowledge of agriculture among the people by the inclusion in the curricula of secondary and primary schools of agricultural subjects.

(*ii*) There is certainly urgent need for extension of teaching facilities in Nadia which I have the honour to represent in the District Board as its Chairman. An industrial school is going to be established at Krishnagar—the headquarters of the district—it is expected to be in working order from April next. Agricultural classes may very well be opened in connection with it by Government. It will prove a great boon to the district.

(*iii*) Teachers in rural areas cannot be drawn from agricultural classes at present inasmuch as they themselves possess no modern scientific knowledge, when they are properly trained it would certainly be desirable to engage them as teachers.

(*iv*) So far as my experience based on information and trend of feeling in the country goes, the attendances at the existing institutions are not as numerous as can be expected. The reasons are that they do not afford any future lucrative career and that there are not proper opportunities and facilities for taking to agriculture as a profession.

The demand for instruction would be stimulated by showing concrete examples that agricultural study might be paying.

(*v*) The main incentive at present for lads to study agriculture is to obtain service under Government.

(*vi*) No.

(*vii*) In my opinion, students of any particular institution should be taken to different places in the Province to study soils, seeds suited to particular areas, peculiar distinctive conditions of different places without being confined to one place. That would enlarge their views, fit them up for setting up in business wherever they please. In a word greater attention should be given to the practical side of education.

(*viii*) Each of these items has some value of its own. The combination of nature study and school farms would be productive of good results.

(*ix*) The careers of the majority of students are confined to ill-paid jobs which create no emulation in others.

(*x*) In order to make agriculture attractive to middle class youths, it must be made sufficiently remunerative. They find that agriculture does not afford them even bare subsistence not to speak of affluence or competence as other walks of life do. In order to do so, scientific methods of modern improved agricultural production, of converting raw agricultural produce into finished products which will find a market both in and outside the country should be taught to them by actual demonstration. They should be taken as apprentices with or even without a small allowance in Government established or other successful farms for several years. Agricultural and industrial banks should be established which would finance them in starting agricultural farms on a commercial basis and Government should through their specially expert officers help them with advice and instructions in running these farms. Markets must also be found for their products. The present stereotyped cultivation of current crops and vegetables in the ordinary way yields no sufficient profit to induce lads of the middle class to take to agriculture. To my personal knowledge some agricultural ventures by sons of well-to-do men with fair capital and on a large scale proved failures—one failure of this nature makes others diffident and nervous. It must be shown by actual demonstration that agriculture can be adopted as a lucrative commercial career before middle class youths can be induced to take to it.

(*xi*) So far as I know—no.

(*xii*) Night schools should be opened and there should be an active propaganda to induce adults to join such schools.

(*xiii*) Government ought to provide money for administration and finance for improvements of agriculture otherwise it would neither be popular nor successful.

QUESTION 3.—The very slight improvement now noticeable in influencing and improving the practice of cultivators is due to propaganda (through exhibitions, lantern lectures) by demonstrators and to practical demonstration—

(*b*) In order to make field demonstrations effective several points are to be considered :—

(*i*) number of demonstrators should be increased.

(*ii*) soils must be specially examined with a view to decide the suitability of some particular variety of crops for that field.

(*iii*) the nature of manure and use of implements suited to the soil should be determined.

(*iv*) steps should be taken to attract the notice of the people to the demonstration.

(*c*) By convincing them of greater yields by following expert advice in connection with the use of improved seeds, manures and implements. Education would also help. Their colossal ignorance and illiteracy are the main causes of their conservatism.

(*d*) The demonstration and propaganda with regard to *Chinsura green* jute seeds are instances of striking success. The reason for the success is the greater yield of the crop, given the facility for washing it. *Kataktara* paddy is also a success. *Charanak* paddy seeds were a failure last year on account of bad seeds.

QUESTION 4.—(*c*) (*i*) No. The number of subordinate staff is very low. The staff should be increased. They must pay greater attention to educating the cultivators in improved scientific agriculture and helping them in introducing new variety of crops.

(*iii*) The roads are exceptionally bad. Transport especially in the rainy season is extremely difficult if not impossible. This is one of the most important factors in agricultural improvement.

QUESTION 5.—(*a*) Co-operative credit societies are now greatly helping the cultivators in financing agricultural operations by them and short and intermediary term loans have also been introduced. As for long-term loans there ought to be separate land mortgage banks preferably on land mortgage basis and Government should be prepared to render liberal financial assistance either in the shape of subscribing to a portion of their debentures or by guaranteeing the interest on such debentures. For the purpose of long-term loans on land mortgage the provision of the Bengal Tenancy Act should be altered so far as regards the transferability of occupancy rights is concerned.

QUESTION 6.—(*a*) (*i*) The main causes of borrowing are :—

(1) Insufficiency of their income from land after defraying the cost of cultivation.

(2) Want of subsidiary occupations.

(3) Medical charges incurred on account of ill-health.

(4) Social system which entails comparatively heavy expenditure on account of marriage, *sradh*, etc.

(5) Failure of crops.

(6) Litigation (in some cases).

(*ii*) (*a*) Village *mahajans* (moneylenders) and

(*b*) Co-operative societies.

(*iii*) The inability to repay debts to co-operative societies is generally due to failure of crops but to *mahajans* it is due both to failure of crops and heavy interest.

(*b*) The measures indicated in the long run would prove harmful to cultivators. These measures would increase litigation which would mean ruin to them. Moreover, the *mahajans* would not advance them money even in cases of dire necessity. The remedy lies in the spread of co-operative societies which lend money at a very low rate of interest compared with the rate of *mahajans*.

(*c*) No. No legislation should be resorted to to artificially limit the rights of cultivators which would have the effect of diminishing the value of their land. These things may be left to be adjusted in the ordinary course through the co-operative societies according to circumstances in each particular case.

QUESTION 7.—(*a*) Co-operative consolidation societies may be started for the purpose of reducing loss on agricultural efficiency due to excessive fragmentation. Better still if members of Union Boards be given statutory authority to make consolidations binding on the parties for several years with the consent of the majority of persons concerned.

(*b*) The difficulties of consolidation are (1) the different grades of interest in land which would be affected by the consolidations, (2) absence of some parties from the village, (3) perversity of some of the parties concerned and (4) unwillingness of landlords to recognise consolidations. So far as Bengal is concerned the difficulty seems to be insurmountable except in cases where all the lands are held under one landlord under one title. Legislation might be made legalising consolidation without payment of *salami*.

(*c*) Legislation should not be resorted to unless sufficient experience is gained through the methods indicated above. Legislation always means increase of litigation.

QUESTION 8 (*a*).—I advocate the adoption of new irrigation schemes in Nadia by way of perennial canals, tanks and wells. In some places canals are necessary and in some tanks and wells. Irrigation canals are only possible under the Agricultural and Sanitary Improvements Act of 1920. Its complex procedure stands in the way of its application. It should be made more simple.

Tanks and wells are not sunk for want of funds.

QUESTION 10.—(*a*) Greater use could be made both of natural manures and artificial fertilisers. Cultivators should have more intimate knowledge of use of natural manures and artificial fertilisers. This knowledge can best be imparted by practical demonstration in farms.

(*b*) By making provision on the lines of a food Adulteration Act.

(*c*) By practical demonstration.

(*f*) By offering a substantial price to owners for cowdung and making other kinds of fuel cheaper and more easily available than at present.

QUESTION 11.—(*a*) (*i*) Improvement of existing crops depends first upon the use of improved variety of tested seeds, secondly upon suitable manures and thirdly upon irrigation facilities. Cultivation must be made independent of natural rainfall. Facilities should be placed to the cultivators for obtaining good seeds and suitable manures at the proper time. This could be done through co-operative seed and manure stores.

(*ii*) As regards new crops, soils of different places should be carefully examined and the suitability of any particular variety of crops for that class of soil should be ascertained. Demonstration should then be held with that crop in the locality either through private agencies supervised by departmental officers or through Government demonstration farms in the beginning.

(*iii*) Distribution of seeds should be made through co-operative seed stores—one such store being established in each Union Board—which would indent only for approved varieties of seeds. Particular attention must be paid to the supply of good seeds inasmuch as failure of one kind of seed shakes the confidence of cultivators in departmental seeds. The Central Banks also may be required to open a central seed depôt which will supply seeds to all primary societies. The Ranaghat Central Bank of which I am the Secretary indents different varieties of seeds and sells them to members of primary societies at cost price.

(*iv*) By taking steps to kill wild animals through *chowkidars* in the mofussil and by giving free licenses to cultivators to keep guns for protection of their crops and training them to use guns properly for the purpose.

(*b*) In Nadia, *kataktara* and *indrasail* paddy may easily supplant present paddy crops. They are yielding greater produce. Except paddy no other crop would be used by people of this part of the country for food.

(*c*) *Indrasail* and *kataktara* have yielded better produce in my experience.

QUESTION 12 (*i*).—Tillage can be improved by using up-to-date scientific implements such as tractors, improved ploughs, etc. These improved implements might be purchased by a co-operative society and then let out on hire to cultivators of neighbouring places which would amply repay the cost of capital outlay—this would also solve to a certain extent the shortage of labour which is felt.

QUESTION 14.—(*a*) The answer is covered by note on question 12 (*i*).

(*b*) By holding demonstrations in Government established farms and showing the cultivators its benefits.

(*c*) More agencies are required for sale of improved implements—manufacturers may establish depôts in suitable centres for the purpose. The cultivators should be taught the method of use and their usefulness. Demand should first be created and then facility placed in their way.

QUESTION 15.—(*a*) The Civil Veterinary Department should in my opinion be under the Director of Agriculture. That would lead to efficiency of service.

(*b*) (*i*) The dispensaries are under the control of District Boards. The system works well so far as funds are available.

(*ii*) The need for expansion is not being adequately met for want of sufficient funds.

(*iii*) I shall not advocate the transfer of control to Provincial authority provided sufficient funds are placed by Government in the hands of local authorities. These institutions should be controlled by non-official agencies according to their needs and requirements.

(*c*) (*i*) and (*ii*) Yes, where there are such dispensaries—at present in most of the sub-divisions there is only one Veterinary Assistant Surgeon who is a touring man and is to move about in the interior for 15 days in a month on an average. The needs of both urban and rural areas will be amply met if a hospital is opened at the headquarter station of each sub-division and a touring man placed in charge of each *thana*.

(*d*) Chief obstacles met with in dealing with contagious diseases are :—

(1) Want of proper reporting by reporting agencies which are generally Presidents of Union Boards.

(2) Submission of indent for serum by the Veterinary Assistant Surgeon who first proceeds to the seat of outbreak and after diagnosing the nature of the outbreak comes back to his headquarters for requisition of serum or submission of indent through the District Board which means delay and consequent loss of cattle in hundreds in time of epidemics.

Mr. N. N. Mukherjee.

(3) Ignorance, illiteracy and conservatism of cultivators.

(4) Prevalence of *godagas* (quacks).

(5) Inadequacy of staff in cases of simultaneous outbreaks. I shall not advocate legislation unless other means fail. The villagers are mostly poor. Legislation in the direction of notification, etc., may lead to oppression if rigidly enforced—spread of education and co-operation seems to me to be the chief remedy to be attempted in the beginning. Public segregation sheds should be constructed and sufficient quantity of land at the furthest end of the village reserved for the cremation or burial of carcasses. But burial of carcasses is not advisable as *Chamars* might dig up graves and use skin for their own purpose, thus helping in the spread of infection.

(6) Yes. On account of the limited resources of the District Board free supply of serum by Government is essentially necessary.

(7) The obstacles in the way of popularising preventive inoculation are (*i*) fees if any charged on this account. In Nadia, no such fee is charged. (*ii*) Illiteracy, ignorance and conservatism of peasantry—much of the present evils among the cultivators is due to want of education.

(8) Yes.

(9) I have no experience of the Muktesar Institute; my idea is that researches should be conducted by officers in the Provinces.

QUESTION 16.—(*a*) (*i*) By elimination of unfit bull-calves, castration, prohibition of slaughter of prime and dry cows, introduction of better animals from outside, provision of adequate number of good stud bulls in each Union by local authorities and by propaganda work as regards the maintenance of animals while in health and disease.

(*ii*) Betterment of the dairying industry can only be achieved on co-operative principles. At Ranaghat a co-operative agriculture and dairy farm is shortly to be started.

(*b*) Pastures in the strictest sense of the term are not in existence in this district, legislation may be resorted to, to compel zamindars to set apart sufficient quantity of land for pasture in each village.

(*c*) During the monsoon from June to September scarcity of fodder usually exists.

(*d*) (1) By starting co-operative societies for the production of fodder, (2) private persons may be subsidised for the purpose and (3) agricultural associations should be encouraged to grow green fodder and to sell it to the general public. This is one of the crying needs and every effort should be made to produce fodder specially green fodder in sufficient quantity.

(*e*) Landowners may be induced to take keener interest in these matters by gentle and sympathetic persuasion, by making them realise their benefit to themselves and to the people in general by showing to them that investment in agriculture and dairying is profitable.

QUESTION 17.—(*a*) An average cultivator works about 300 days in a year. He does not do much in the slack season except those who have got very small holdings or *utbundi* lands and who work as labourers.

(*b*) The adoption of subsidiary industries may be encouraged by establishing such industries in suitable centres where they may be employed on payment of wages during such slack season. This would have the effect of training them in the art. When they would see the advantages of employment in such subsidiary industries they would themselves take to them being financed with small capital by co-operative societies. We must show them the way in the beginning—spinning, weaving basket and rope making may be introduced.

(*c*) (1) Want of sufficient knowledge and information on the part of cultivators as to how these industries may be properly conducted.

(2) Want of funds.

(3) Want of combination and co-operation among the cultivators.

(4) Want of facilities put in their way for production and marketing.

In order that these subsidiary industries may thrive, we must first train them in the art by paying them their wages. We must provide means for marketing the finished products from their houses by making payments.

(*d*) Certainly.

(*e*) Yes. The answer is covered by answer to first portion of (*b*) above.

Industries on co-operative or joint stock basis may be established in rural areas in suitable centres. Government should also start such industries or subsidise others to start them.

(*f*) Certainly.

(*h*) By propaganda, education. They must be made to understand and appreciate the advantages that would accrue to them.

Mr. N. N. Mukherjee.

QUESTION 18.—(*a*) (1) By granting the labourers homestead land free of rent and some land for cultivation at a very low rate of rent.

(2) By making arrangements for medical help when necessary.

(3) By making legislation so that a man once brought from an outside area would be bound to serve for the stipulated period at a fixed rate (as the last means).

The above suggestions apply to cases where there is a permanent deficiency for labour and large tracts remain uncultivated.

In tracts where there are no such advantages higher wages seem to be the only remedy.

(*b*) The shortage of labour in this district is attributable mainly to the havoc caused by malaria which levies a heavy toll year after year on the agricultural population considerably impairing the vitality of those surviving.

The remedy seems to be in the improvement of the sanitary and economic conditions of the people and by bringing people from outside to settle in the locality by means indicated above.

(*c*) Covered by answer to (*a*) above.

QUESTION 22.—(*a*) (*i*) So far as financial assistance to ordinary credit societies is concerned, there is no need for such assistance. But Government should be prepared to render financial assistance to new forms of co-operative societies, especially industrial societies. It is, however, very necessary that Government should spend sufficient money for propaganda through the Bengal Co-operative Organisation Society and otherwise and to strengthen the staff of the Co-operative Department by increasing the staff of Inspectors and Auditors, by reviving the post of Deputy Registrar and also by giving adequate facilities for travelling.

It is also necessary that Government should make grants to Central Banks and other Central societies to enable them to maintain a sufficient and efficient staff of supervisors.

I think Government should bear the cost of audit as it does with regard to Municipalities and District Boards. Government should also give facilities of banking to all Central Banks through the treasury.

(*ii*) (1) By giving financial help to the Bengal Co-operative Organisation Society, to carry on more intensive and extensive propaganda through non-official agencies.

(2) By allotment of seats to representatives of co-operative societies in the Legislative Council.

(3) In District Boards.

(*b*) The credit societies are working well and affording great relief to the people by reducing the rate of interest. But attempts should be made to augment their sources of income by agricultural improvement.

I consider the spread of other forms of co-operative societies highly desirable. They would teach the people self-help, self-reliance and would go a great way in improving their economic and sanitary conditions. But the difficulty lies in organising these societies and running them successfully. Energetic and enterprising people are not always available in rural areas. Government ought to make serious efforts in these directions. Without Government help in the initial stages in organising, supervising and financing these societies, they are not likely to be a success.

(*c*) Yes.

(*d*) Up till now I have experience of credit societies only. I think they have achieved their object.

QUESTION 23 (*b*).—(*i*) By making primary education compulsory among the agriculturists and at the same time giving them practical training in agriculture, in dairying, poultry breeding, carpentry, smithy, etc.

(*ii*) There is no compulsory education now in rural areas.

(*iii*) Poverty of the agriculturists who cannot afford to keep their boys in schools when they are sufficiently of age to help them in their work.

QUESTION 24.—(*a*) (1) To show by demonstration that agriculture might be a lucrative concern.

(2) Encouraging men of capital and enterprise to start agriculture on a commercial basis guaranteeing a certain profit or dividend on the capital expended.

(*b*) The Tenancy Law is a great hindrance to improvements on agricultural land. The zamindars who are the absolute owners of the soil in Bengal under the Permanent Settlement and who are generally not in actual possession of the land are not at all interested in making any improvement. The same remark applies to *patnidars*, etc. The occupancy ryots are generally too poor to make any permanent improvement, even the small minority of those who can afford to do so are opposed by zamindars who demand exorbitant *salami* or premiums. Tenants of inferior status have no right to make any permanent improvements and even if they have such right, they are not interested in doing so as they have no permanent interest in the land.

Mr. N. N. Mukherjee.

QUESTION 25.—This question raises the most important point now occupyin the mind of all thoughtful men in the country, *viz.*, how to improve the hygienic conditions in rural areas and to promote the general well-being and prosperity of the rural population. Only those who have any experience of rural conditions can realise the gravity of the situation. Great sustained and systematic efforts will have to be made by Government, local bodies and the people themselves for this purpose. Conditions differ in different places. But, generally speaking, attempts might be made in the following directions :—

Improvement of sanitary conditions of the people of rural areas.

The sanitary conditions of villages where population has become very thin cannot be improved without people being brought from somewhere else to settle in these villages. In the first place it is beyond the power of a small number of men living in a village to remove huge jungles in and round the villages. Even if it be possible to do so, the jungles would grow with greater vigour next year unless they are brought under cultivation. It is therefore in my opinion essential that people from other places will have to be brought to be settled on these villages, they should be given land free of rent on condition that they would reclaim the jungly lands and cultivate them free of rent for several years. If necessary legislation must be resorted to as the last means. Some villages have become so very bad that instead of attempting to renovate them, the remnant of the dying people may be induced to settle on the open lands on the outskirts and they should be given pecuniary help in doing so rather than spending any money over the village itself.

The improvement of the condition of roads is one of the most potent factors of village regeneration. Only those who have gone into a rural village in the rainy season could realise the difficulties of village life. The cry of " Back to the villages " is impossible of realisation unless communications are improved. Improvement of agriculture, sanitary and economic conditions depends greatly on communication. We see that as soon as a railway line passes through a village and a station is opened, it begins to thrive. The reason is *bhadralogs* come back to the village, shopkeepers, artisans, etc., settle there on account of their business, trade revives bringing in its train most of the amenities of modern life.

Village paths may be left to the villagers. Big communication roads must be improved and if possible made passable by motor cars throughout the year.

This could be possible if Government would give some financial help to the District Boards. Government should pay half the cost of metalling a road by way of grant and the rest by way of a loan. The District Boards should be given a free hand to levy tolls irrespective of the cost of the work (there is a provision now that District Board cannot levy tolls unless the cost exceeds Rs. 10,000 and cannot do it for more than 20 years) to recoup the amount together with interest thereon and future maintenance charges. I am perfectly sure that people benefited would gladly pay tolls for the benefit they derive.

Bhadralogs would not come back to villages unless the communications are made easy; unless they come back, permanent improvement is not possible.

Proper medical and educational facilities must be provided in villages. The want of these facilities drive all the people who can afford to do so to leave the villages and settle in towns.

Improvement of communications would make the opening of co-operative societies, commercial agricultural farms, their supervision, marketing, medical and educational facilities easy and lead to economic development.

Greater attention must be paid to education in its practical side—whether higher, secondary or primary. Education is a panacea for most of our evils. To my mind practical training in agriculture, industry and hygiene in higher and lower studies is absolutely necessary for the economic uplift of the country and on that would depend the improvement of the sanitary condition of rural areas which afford great opportunities for the development of our material resources. Whatever we might do would not be of any permanent and all pervading benefit unless accompanied by practical education in all its branches. Practical education would give a stimulus which is now wanting.

Settling people in depopulated villages, improving the means of communication, and practical education in agriculture, industry and hygiene are the most important factors for general well-being and prosperity of rural areas.

Great attention must be paid to supply of good drinking water and removal of water-hyacinth.

Binding regulations should be enforced in rural areas through Union Boards.

QUESTION 26 (*b*).—Yes. Information on these heads should be more effectively placed before cultivators. Information with regard to jute forecasts is one-sided only now. Agriculturists should have information with regard to the requirements of each year for each particular crop.

Oral Evidence

20076. *The Chairman:* Mr. Mukherjee, you are Chairman of the Central Co-operative Bank, Ltd., at Ranaghat ?—Yes.

20077. You have put in a note for which we are indebted to you. Do you desire to make any remarks of a general character before I ask you a few questions ?—Yes. I wish to observe that agricultural and sanitary improvements are interdependent, and that the whole question depends on finance. Moreover, if any money is available, I should like it to be spent at the bottom and not at the top; it should be spent in strengthening the agricultural and co-operative staff at the bottom. That is what we want.

20078. What grades are you thinking of there ?—The demonstrators, those who actually come in contact with the cultivators.

20079. You feel they are not quite getting down to the cultivators, because there are not enough of them ?—Yes, and I think men of higher training than those at present engaged should be employed for the purpose. We have only one demonstrator for our whole sub-division, comprising 500 villages, and with a view to cut down expenditure on travelling he has been asked not to travel more than five miles from headquarters. That is no use. By means of demonstrators, cultivators could be induced to use new varieties of jute seed and new varieties of potatoes and sugarcane, but if the only demonstrator we have is restricted to an area within five miles of the headquarters it is no use keeping him. You cannot do anything with such restrictions. More men should be employed to bring the results of research and investigation to the homes of the cultivators.

20080. Your point is that it is no use having research unless you bring the results of that research to the notice of the cultivators ?—Exactly, and if a choice had to be made I should spend money on having men to carry the knowledge we have already to the cultivators rather than on research.

20081. On page 177 you deal with the very important question of extending the use of good seeds, and I see you say there that *charanak* paddy seed proved a failure in 1925 ?—Yes.

20082. Where did that seed come from ?—I wrote to the District Agricultural Officer, and he sent it. I do not know where he got it from.

20083. Did you make a complaint ?—Yes; I told him it was an entire failure. This year also I got 10 maunds from the Government farm at Dacca, and subsequently indented for 15 maunds from him.

20084. Are you quite sure the *charanak* paddy seed failed because it was bad seed, and not because it was badly planted ?—Yes, because it failed everywhere.

20085. The germination was bad ?—Yes.

20086. What was the outcome of your correspondence ? Did the Agricultural Department admit that the seed they sent you was bad ?—They had to keep quiet; there was no way out of it.

20087. What do you mean by that ?—I said the seed did not germinate, and no further correspondence took place between us.

20088. But you had to pay for it ?—Yes.

20089. *Professor Gangulee:* When they supplied you with the seed, did they declare the germination test ?—Last year I did not take that declaration, but, learning by experience I this year insisted that they must guarantee high germinating power or I would not take the seed. This year they did certify it, but in one case the report of the District Agricultural Officer did not turn out to be true, and I withheld payment for that consignment.

20090. *The Chairman:* On page 177 you are concerned to attempt the consolidation of fragmented holdings, and your view is that Union Boards might be given statutory authority to enforce consolidation, binding on the parties for several years ?—Yes.

20091. Is it your view that if these parties had practical experience of the advantage of consolidation for a number of years, they would consent to perpetuate it ? You think they would then agree to a permanent arrangement of that sort ?—Yes.

20092. Your recommendation there would give the Union Boards very great power in the matter, would it not ? Are you satisfied that they are the appropriate bodies to which to give so much power ?—Yes, because I have gone through the scheme which was in force in the Punjab.

20093. It was adopted voluntarily in the Punjab, was it not?—Co-operative societies to carry out these things were established, and the parties had to pay a certain amount of money. We have a constituted statutory body in the villages, and I think this matter

might be entrusted to them and so the parties would be relieved from making any payment. Moreover, the members being local people would be able to arrange consolidation amicably among the parties.

20094. Do you suggest the Union Boards should be empowered to compel a whole village to give effect to consolidation, or that they should be empowered to compel a small minority of villagers to conform to the wishes of the majority ?—The latter, for the present.

20095. You would be content with that ?—For the present. When they saw the advantages of these consolidations they would come forward of themselves. We do not wish to bring too much pressure to bear on the people at the beginning.

20096. *Mr. Calvert :* You said that in the Punjab the parties had to make a payment. There is no payment ?—Yes, on account of the co-operative society being set up they have to pay something.

20097. Government pays ?—I do not know ; I think the parties have to pay something.

20098. No ?—Then that is a misunderstanding on my part.

20099. *The Chairman :* From what you say on page 178 I see that, contrary to the view of some witnesses who have appeared before the Commission, you are definitely in favour of placing the Civil Veterinary Department under the Director of Agriculture ?—Yes.

20100. What are your grounds for making that recommendation ?—They are cognate branches of the same thing ; both relate to agriculture, and therefore I think it would be better that they should be under one head instead of two.

20101. Are you satisfied with the services at present rendered to the public by the Civil Veterinary Department ?—Yes, so far as they go, but I think their staff should be strengthened. At present we have only one resident veterinary surgeon in a sub-division.

20102. Have you any instances on which you would care to found the view that the Veterinary Department should be under the Director of Agriculture ?—I have not got any specific instances. Veterinary surgeons are now under the Superintendent of the Veterinary Department, but if the Director of Agriculture thinks that such a man should go to a certain place or act in a certain way, I think it would be better for him to give instructions, rather than a separate department.

20103. You think that good service is being given at the moment by the Veterinary Department ? You have no specific instances to give in support of your proposal, but you adhere to the view that the Veterinary Department should be under the Agricultural Department ?—Yes, that is my impression.

20104. On page 181 you say your ambition is to provide the cultivator of jute with all possible information about markets and kindred matters. That is natural and sound, but I see great difficulties in putting the information at their disposal, do you not ?—Machinery should be created through which information could be given to them. At present the whole arrangement is one-sided ; the jute forecasts benefit the dealers without giving a corresponding advantage to the cultivators. The dealers control the prices, whereas the cultivators can only control their own cultivation.

20105. What are you concerned to do ? Is it to give the cultivator information which will be useful to him in deciding how many acres to put under jute, or to give him information of market rates, with a view to his holding up his jute if he thinks the market will improve ?—First of all, as to what amount of land he will put under jute.

20106. Do you think it is possible to make a forecast in time to assist the cultivator in that decision ?—I think it can be done.

20107. Plainly the information which is valuable to merchants (estimates, for instance, of the effect of weather conditions on crops already planted) is of very little use to the cultivator ; it is too late for him then ?—Cannot it be given to them just in time for them to grow the jute ?

20108. You will have to see a whole crop ahead to do that ?—Yes, certainly.

20109. *Sir Henry Lawrence :* On the one page of your note you say the improvement of agricultural, sanitary and economic conditions depends greatly on communications. You have been, or you are, Chairman of a District Local Board ?—I am Chairman of the District Board of Nadia.

20110. Does your District Board have control of primary education ?—Yes.

20111. And also of expenditure on communications ?—Yes.

20112. Is it your view that expenditure should be concentrated on communications in preference to education ?—No, I do not say that ; both must be taken in hand.

20113. Both are equally important ?—Certainly.

20114. I rather thought by this passage here you meant to imply that expenditure had not been sufficiently concentrated on communications ?—My point is this. I have made a special point of the fact that education is the panacea for most of our evils ; it would remove most of our difficulties, at least among agriculturists. There are many good things we cannot do on account of the ignorance and illiteracy of the cultivators. Education, therefore, cannot be neglected. At the same time, means must be found to improve communications, on which the improvement of agriculture and of sanitation in rural areas depends a great deal. I have suggested a means whereby the extra income required may be obtained.

20115. But if a point is reached where a Board has to decide whether to spend money on education or communications, you will be in a difficulty ?—No ; I am convinced that education must be improved. If there is a tie between the two I should go in for education rather than communications.

20116. You say further, " Improvement of communications would make the opening of co-operative societies, commercial agricultural farms, their supervision, marketing, medical and educational facilities easy and lead to economic development "?—Yes, exactly.

20117. It seems to me in your note that you regard the improvement of communications as the foundation of everything ?—Not altogether. All these things must go hand in hand. One cannot lag behind the other.

20118. Your view is that your communications are not good at present and must be improved ?—Yes.

20119. You wish to raise money for the purpose, and you look to tolls for it ?—Yes.

20120. You have not got a free hand in levying tolls ?—No.

20121. Have you any tolls at all ?—Yes. In matters which involve a capital expenditure of over Rs. 10,000 we can levy tolls, but only for 20 years. There are many roads which could be made passable throughout the area by levying tolls, if the District Boards were given a free hand to do it. That is a point which I have rather insisted on, because we cannot curtail our expenditure on education, medical and other matters. So far as the Nadia district is concerned our expenditure on education is Rs. 1,00,000 and on medical matters, etc., Rs. 1,00,000 and on communications 1,30,000 ; but that is not sufficient. We have 1,435 villages in the district and about 1,000 miles of *kutcha* roads and 200 miles of *pucca* roads. It is impossible to make the roads *pucca* or even passable in the rainy season with the small amount at our disposal. We must find money to improve the condition of these roads, and direct taxation is always looked on with great disfavour by the people, whereas they have not the same objection to indirect taxation and will be glad to pay small tolls provided the roads they have to use are made passable or *pucca*.

20122. I think you have made a good point there, but I should like to know what it is you want done. Do you want an alteration in the law ?—Yes ; the law will have to be altered in that respect.

20123. Is it the law or an executive order of the Government that holds you up ?—The law ; the Local Self-Government Act. I think the limitation I mentioned is going to be reduced to Rs. 5,000 ; the District Boards will be given power to levy tolls in respect of works involving a capital outlay of Rs. 5,000 only. Still further powers are wanted, however. There should be no limitation of the power of District Boards to levy tolls when they are satisfied that the people would be willing to pay a toll in respect of a particular work.

20124. *Mr. Gupta :* My impression is that the present power to levy tolls is confined to bridges only, and not roads ?—Yes, it is for bridges only.

20125. *Sir Henry Lawrence :* You have not the power to levy a toll for the improvement of a road ?—No.

20126. And you wish to have that power ?—Yes.

20127. When was this Act passed ?—It is the Act of 1885.

20128. Has it been amended since ?—From time to time, but no wholesale amendment has been taken in hand since 1885.

20129. When do you hope to get this increased power ?—I think it will come up in the next legislature.

20130. Do you think it will be a popular move ?—I think it ought to be.

20131. You have the opinion of your district behind you in asking for it ?—Yes.

Mr. N. N. Mukherjee.

20132. And you are doing your best to carry it through ?—I have no power to carry it through in the legislature.

20133. Are you a voter ?—Yes, but I am not in the legislature as a councillor.

20134. Have you got compulsory education ?—No.

20135. Is there any idea of your having it ?—It cannot be done on account of want of money.

20136. You have no Compulsory Education Act in this Presidency ?—It has not been extended, and we cannot do it.

20137. What do you mean by saying it has not been extended ?—There has been an Act which would have to be extended to a particular area for it to be enforced in that area, but it has not been enforced and it would be rather unpopular if it was.

20138. Your District Local Board has the power to bring this Act into force ?—No, it is only the Government that can do it.

20139. On the application of the District Board ?—No, the Government can do it on its own motion, as far as I know.

20140. *Mr. Gupta :* On the application of the Municipality or Union Board concerned it can be put into force, and Government pay half the cost ?—But the difficulty is the people would not be willing to incur any direct taxation to enable it to be introduced.

20141. In other words, they will not apply ?—That is so.

20142. *Professor Gangulee :* Have you made any attempt in that direction ?—The villagers are not willing that it should be extended.

20143. On financial grounds ?—Yes.

20144. They are not willing to tax themselves ?—No.

20145. They object to an education cess ?—Exactly.

20146. *Sir Henry Lawrence :* What is the burden of the cess at present ?—The cess is only on the land ; it is 6 pies in the rupee for the road cess and the same amount for the public works cess.

20147. Is there any education cess ?—No.

20148. *Sir Ganga Ram :* On the valuation of the revenue ?—On the rent, so to speak.

20149. *Professor Gangulee :* Not on the valuation ?—Rent returns are made by the landlords to the collector, and he makes a valuation, and on that valuation the cess is imposed.

20150. *Sir Henry Lawrence :* Is there no local charge at all for education ?—No.

20151. The whole cost is met out of provincial revenues ?—No, we pay a certain amount from the district funds. Part comes from the Government and part from the District Board.

20152. You are talking to people who know nothing about your conditions. Can you tell us how your money for education is obtained ?—Our principal sources of income for a District Board are the road cess and the public works cess. These are raised from the people, and from that fund we allot certain amounts to education, medical work, roads, etc. Out of that fund Rs. 51,000 is found by the District Board for education, and Rs. 49,000 is obtained from the provincial revenues for education.

20153. If you want to have compulsory education introduced, by what means would you raise the revenue, by another cess ?—If we have to make primary education compulsory I do not see any other means except an education cess, which would be very unpopular.

20154. Have you got the legal power to raise that cess ?—No.

20155. If the Act is extended to your district on the application of your District Board, does not that authorise the District Board to levy a cess ?—Yes, that would.

20156. *Sir Ganga Ram :* You say in your note that appreciable improvement has been made by the action of demonstrators and cinemas ?—Yes.

20157. Will you specify what improvements have been made ? Has the yield been increased ?—Yes, to a certain extent, in respect of crops which have been introduced by the demonstrators.

20158. Specify clearly what improvements have been made ?—Take jute, for example; formerly our country jute used to produce 5 maunds to the *bigha*.

20159. How many *bighas* go to make an acre ?—Three.
Mr. Gupta : Two and a half.

20160. *Sir Ganga Ram :* And what do you produce now ?—Seven maunds.
20161. Is that due to the demonstrators ?—Yes, and to the new seeds.
20162. Is it also due to improved seed ?—Yes, and the improved seed was introduced by sending demonstrators to the mofussil and explaining to the cultivators that it would be to their advantage to grow it.

20163. Do the demonstrators advise them on improved methods of cultivation ?—No.
20164. Or improved implements ?—No.
20165. It is simply a question of seed ?—Yes.

20166. In one year you say all the seed you took from the Agricultural Department failed ?—No, only the *charanak* paddy seed. There are two paddies ; *charanak* and *kodaptur*. This time the *charanak* has been a success.

20167. Did the Agricultural Department supply seed to the whole of your district, or were there any people there who obtained their seed from other sources ?—The Agricultural Department did not supply all the seed.

20168. And did the seed obtained from other sources fail as well ?—No.
20169. It was only the Agricultural Department's seed which failed ?—Yes, and only that one variety.

20170. Did you find out why it failed ? Was it old seed ?—I cannot say. All I know is that it failed.

20171. Did you get any explanation from the Agricultural Department ?—No ; I cannot call for an explanation from the department.

20172. You can ask them why it failed ?—The seeds were not sound.

20173. People who planted other seeds did not have theirs fail ?—No.

20174. It was the fault of the seed ?—Yes.

20175. Are you a paid Chairman, or honorary ?—Honorary.

20176. What is your profession ?—I am a Vakil of the High Court.

20177. What proportion of the revenue does your Board get as its income ?—The allotments are made under separate heads. The Government earmark certain money for expenditure in a certain way. Government earmark Rs. 49,000, for example, as a grant for education.

20178. Your income is derived partly from Government revenue ?—Yes.

20179. What percentage do you get ? Is there a percentage fixed ?—No.
In other Provinces 12½ per cent. or something like that, is taken from the zamindars and placed at the disposal of the District Board.

20180. *Dr. Hyder :* What local cesses have you ?—Public works and roads.

20181. Besides the land revenue you pay, what other cesses are paid by the zamindars and ryots ?—No others.

20182. *Sir Ganga Ram :* What is the income of your District Board ?—It consists of contributions by Government under certain specific heads and an augmentation grant, given according to the income of each District Board ; and the public works and road cesses.

20183. These cesses are earmarked for these purposes ?—Yes.

20184. Do you take care that the money earmarked for roads is spent only on roads ?—No, because we spend it on other heads.

20185. *Sir Ganga Ram :* When you receive from the zamindars a cess to be spent on a certain thing, why do you spend it on other things ?
Mr. Gupta : The law empowers them to do so.

20186. *Sir Ganga Ram :* You say you have in your district 1,000 miles of *kutcha* roads ?—Yes.

20187. Are they all bridged ?—No, not in most places. In one or two places there are bridges, but in others there are none. Even small streams are not bridged.

20188. Then a person cannot go from one place to another ?—No, they will have to take a ferry. There may be culverts here and there, but that is all.

20189. Are there culverts wherever necessary ?—No, there are several gaps.

20190. Can a producer take his produce to market without interruption ?—No.

20191. *Dr. Hyder :* Are there any ferries maintained by the District Board in your district ?—Yes.

20192. *Sir Ganga Ram :* Who levies the ferry toll ?—We do, but there are also Government ferries for which Government levy the toll.

20193. Will you define what your ideas are about sanitary improvement ? How do you arrange your water-supply ?—By giving tanks and wells.

20194. Wells ?—Yes, *pucca* masonry wells.

20195. And you allow people to dip their buckets in ?—Yes.

20196. Is not that a source of infection ?—You cannot prevent that.

20197. Tell me what is the practice there ? Is the practice to allow every man to dip the vessel whether that vessel may be contaminated with cholera germs or something else ?—Yes, we do allow it now.

20198. And do you sink your wells separately from the village tank in which all the cattle are washed ?—Yes ; tanks and wells are separate.

20199. Do you take them away from the habitation or do you keep them near the habitation ?—Near the habitation.

20200. Near the tanks where the cattle are washed ?—Generally speaking we are spending money on wells because they can be protected.

20201. But where is the protection if you allow the people to dip their vessels in ?—In a tank all the people and cattle go in.

20202. Please give me your answer separately for wells and tanks. With regard to wells what precaution do you take ?—We disinfect them periodically with potassium permanganate.

20203. You allow the people to dip their vessels ?—Yes.

20204. You have no other system ?—No other system.

20205. That is one improvement in rural sanitation which you want ?—Yes.

20206. And where do you have it, away from the habitation ?—In the centre of the habitation so that it may be accessible to all the villagers. They are big masonry wells.

20207. Water goes through the subsoil ?—That you cannot prevent. That is the best water that you are in a position to give.

20208. Is sanitary improvement a part of the District Board's responsibility ?—Yes, there is a Health Department.

20209. How much money do you spend on sanitary improvement ?—About Rs. 20,000.

20210. Every year ?—Yes, every year.

20211. In your district ?—In my district.

20212. What is the total income of your district ?—About four lakhs.

20213. Your District Board alone ?—Yes.

20214. *Sir Henry Lawrence :* Is there a sanitation cess ?—No.

20215. Is that money obtained from the road cess ?—Yes.

20216. *Sir Ganga Ram :* You said something about rotation of jute. Do you consult the Agricultural Department for rotation ?—I did not say so.

20217. You have said that the zamindars ask them how much land should be put under jute. Do you ask the Agricultural Department for advice as to how much land should be put under jute ?—No. I wanted the cultivators to know beforehand the total requirements of the year so that they might regulate the extent of land which they would put under jute and thus prevent under-selling their production.

20218. *Sir Thomas Middleton :* I want you to go back to the question which you discussed with the last Member, about the powers under the Education Act. You have a permissive Act as it is called in Bengal ?—Yes.

20219. Dated ?—I think 1920.

20220. Now under that Act if you make an application, Government can pass an order empowering you to introduce compulsory education ?—Yes.

20221. If advantage were taken by your District Board of that power, do Government promise you some definite proportion of your expenditure on education ? You are now

spending, you told us, Rs. 51,000 and Government are giving Rs. 49,000. Assuming that you had a scheme for compulsory education which involved in some locality an expenditure of Rs. 1,00,000, would Government automatically increase the grant to about the same sum ?—No ; at least there is no liability at present so far as I know.

20222. It is a question of arrangement in every particular case ; there is no automatic grant depending on your expenditure ?—No.

20223. *Mr. Gupta :* Are you aware of the provisions of this Act accurately ?—I am not perfectly aware of them.

20224. There is no power to levy any cess and Government do provide half the cost of the initial expenditure and a certain proportion of the recurring cost ?—That might be ; I saw the Act long ago and consequently I do not remember its provisions just now.

The best thing would be to get information ; otherwise the Commission does not have the correct information.

20225. *Sir Thomas Middleton :* May I know if it is a substantial percentage or a small percentage ?

Mr. Gupta : It is a small percentage ; if necessary I shall send for the Act.*

20226. *Sir Thomas Middleton :* Now to go back to page 176 of your note, you advocate a larger number and a better output of demonstrators ?—Yes.

20227. About what number of demonstrators do you think is needed in a district such as yours ?—I should think there must be one demonstrator in each *thana.*

20228. How many have you in your district ?—In my sub-division I have got only one demonstrator.

20229. And you would like to see how many ?—At least five.

20230. *Sir Henry Lawrence :* What is a sub-division ?—The district is divided into several parts and each of these parts is called a sub-division. My district contains several sub-divisions and in each sub-division I think there is only one demonstrator now. I am not sure whether each has got a demonstrator, but I have got one by writing to the Director of Agriculture, after a good deal of effort, I think.

20231. *Dr. Hyder :* You said just now that you would like to have one demonstrator in every *thana* ; how many *thanas* have you in a sub-division ?—I have five in my sub-division.

20232. On an average there are five in a sub-division ?—Generally I think.

20233. *Sir Thomas Middleton :* That gives some indication of what you would like to see ?—Yes.

20234. Now as to the quality, do you think it is possible or do you think it is desirable that we should have engaged on this work men who have studied at least to the Intermediate stage ?—I do not place so much trust in the general education as on the particular departmental education, agricultural education and the knowledge they may have.

20235. Is it possible, do you think, to give the necessary amount of technical knowledge unless they have had a good general education ?—It is not always necessary, I think. In our villages the cultivators know sufficient of these agricultural matters ; but they have not got the money to utilise that knowledge about good manures and all these things.

20236. How would you get that quality of demonstrator which you desire to see ? How would you train him ?—By giving him practical training somewhere so that he may examine the soil ; he may decide and ascertain as to what seeds would be suited to any particular area, as to what manures would be suited to that particular land and so on.

20237. *Mr. Gupta :* Do you give that training in your district farm ?—Yes.

20238. *Sir Thomas Middleton :* At what age would you begin to give him that training ?—At 16 or 17.

20239. Then you would have him trained for what period ?—For four or five years.

20240. You think a boy of 21 would be wise enough to go and advise the cultivator ?—Provided he has had sufficient training.

20241. He must be cleverer than most of those I have come across ?—That would depend on the capacity of the man.

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* Bengal Act No. IV of 1919. (The Bengal Primary Education Act, 1919)—Section 4.

20242. *The Chairman:* Or the teacher?—Yes; also of the teacher to a certain extent; but I attach greater importance to the practical side of the education than to the theoretical side.

20243. *Sir Thomas Middleton:* I attach equal importance to the practical side. I do not think you attach sufficient importance to the early training?—We lawyers, when we come out of the college with the knowledge of books, do not know what to do when a case comes to us. Now we have put in 30 years of practice at the Bar and we have forgotten much of what we read in the college, but we can help our clients by our experience.

20244. It is quite the same in agriculture. If we could get as many recruits as you lawyers should we have enough demonstrators?—Exactly; but agriculture is not such a good opening. I should very much like to put one of my sons into agriculture but there are no openings.

20245. *Professor Gangulee:* Therefore he is going to be a lawyer?—Yes, because there is no other opening.

20246. *Dr. Hyder:* A personal question. Have you got enough land?—Yes; I did agriculture for several years and made a loss of Rs. 1,000 in three years and gave it up in disgust.

20247. *Sir Gunga Ram:* About 300 *bighas* of land?—Yes.

20248. And from 300 *bighas* of land you made a loss?—Yes. About 30 or 40 *bighas* were within the municipality and I could look after them every day; that is of course where I experimented.

20249. *Sir Thomas Middleton:* You are a well-educated man and experienced and still you made a loss?—Yes.

20250. *The Raja of Parlakimedi:* Was the season against you?—Yes; labour was not available, neither a market nor irrigation.

20251. *Sir Ganga Ram:* Is it irrigated land?—No.

20252. Then there is no hope for agriculture as a profession in your Presidency, is that right?—Unless improvements are effected in irrigation, manure, seed and labour. These are the principal things and we must concentrate all our attention on these things if we want to do something.

20253. *Sir Thomas Middleton:* On page 178 of your memorandum you make a suggestion. You say 'By offering a substantial price to owners for cowdung and making other kinds of fuel cheaper.' Surely your object should be to get the owner of the cowdung to use it on his land?—Yes; of course, if he can do so, it is all right. But he may also sell to others who have not got it.

20254. Can he spare from his own?—It may be a man has got several heads of cattle but no land and it may also be that a man has got plenty of land but not the requisite number of cattle; so the whole thing may be adjusted.

20255. On page 179, in discussing the difficulties you have in getting good animals, you refer to the prevalence of quacks. Are there many of these men practising in a district like yours?—I cannot give you the exact number.

20256. I only want to know whether they are commonly found in villages?—Not commonly.

20257. You say, on the same page, that you would prohibit the slaughter of 'prime and dry cows.' But surely people do not slaughter good cows in your districts?—I suppose not; but they are sold to people who take them to Calcutta and other places and there they are slaughtered. We have no proper system of slaughter houses in the districts; the people sell them to *beparis* who take them elsewhere for slaughter.

20258. You use the word 'prime.' Do you mean by 'prime' good cows? Do they sell good cows?—Yes.

20259. *Professor Gangulee:* Do they sell good cows when they are in milking condition?—Even then they sell for want of money, I have seen people doing so.

20260. *Dr. Hyder:* What do you mean by saying 'for want of money'? To pay their debts?—Yes, or for some other reason.

20261. I understand from your paper that you want sanitation, sanitary improvements, water-supply, one demonstrator for every *thana*, development of co-operation and a hundred other things. Now tell me where is the money to come from for all these things?—That is the greatest difficulty.

20262. Are you over-taxed or under-taxed in Bengal ?—Over-taxed. That is the cry all over the country.

20263. Let me go back to this cry. Since the days of Lord Cornwallis there has been no change in taxation so far as land is concerned, is not that so ?—I do not know; the Road Cess Act, I think, came after that.

20264. You refer to the Permanent Settlement ?—Yes; that is also a tax on the land.

20265. I say there has been no change since the days of Lord Cornwallis ?—Of the Permanent Settlement ?

20266. Of the revenue demand ?—But the public works cess is also charged on the land.

20267. And there has been no change in that ?—I cannot give an unqualified answer.

20268. You know in other Provinces there is a periodical revision and the demand is either increased or decreased ?—Yes.

20269. But there is a periodical adjustment ?—Yes; and in *khas mahal* land also there is that.

20270. It does not form the bulk of your land ?—No.

20271. Let us confine ourselves to the bulk of the lands. There has been no change in the revenue demand since the days of Lord Cornwallis ?—No.

20272. And there has been a change in that demand in all other Provinces, is not that so ?—Yes.

20273. And the bulk of the money that is spent on these different things is provided by the people of other Provinces by themselves ?—Yes.

20274. But here you are not prepared to provide this money and you still want these things to drop from Heaven ?—The tenants pay to the zamindars and the advantage of the Permanent Settlement goes to the zamindars and not to the tenants.

20275. *Mr. Gupta:* What about the road cess and the public works cess which are paid by everybody in Bengal ?—It is also a matter which I have already referred to.

20276. *Sir Ganga Ram:* Is there no cess on law ?—No, except in this way that all Pleaders have to pay Rs. 25 every year, barring of course the High Court Vakils; we pay Rs. 500 in one lump sum.

20277. Your income is derived chiefly from the zamindars ?—Not necessarily; zamindars also are our clients, just as other people, traders, merchants and others.

20278. *The Chairman:* Do you not pay incometax ?—Yes.

20279. *Dr. Hyder:* You give a very interesting cause of indebtedness. You say on page 177 "medical charges incurred on account of ill-health." Are you referring to the *bhadralog* or to the real cultivator ?—To the real cultivator.

20280. Tell me how much does he pay on account of the physician's bill ?—Whenever an illness occurs in a cultivator's house, in ordinary cases he cannot afford to engage a doctor; but if there is serious illness he has to engage a doctor and does pay for the medicine charges. I know that even if some of them can pay for the medicine they cannot even pay for the fruits and other things which are required for nourishment.

20281. Are there no dispensaries in your district where the people get medicine free and where treatment also is free ?—Our condition has been reduced to such a state that even in charitable dispensaries which we have got in my district, we are now levying a fee of one anna for the first prescription for every patient and one pice for every renewed prescription, because otherwise we cannot maintain these dispensaries.

20282. And you are still of opinion that medical charges form a big item ?—In the district of Nadia we have only 26 dispensaries. We cannot afford free medical relief to all the cultivators.

20283. Have you not, under the Agricultural and Sanitary Improvements Act of 1920, any powers of taxation ?—That is almost a dead letter on account of the complexity of the procedure.

20284. What is the complexity of the procedure ?—First of all, the villagers must make an application and deposit money for the cost of the preliminary survey, and if after the preliminary survey it is found that the scheme would not succeed, the scheme would be dropped and the money paid would be lost.

20285. They forfeit the deposit ?—Yes; they forfeit the deposit.

20286. *Mr. Gupta:* The money is spent in preparing the scheme ?—Yes.

20287. *Dr. Hyder:* You do not think it is a check on wild schemes ?—The result is that not a single scheme that I know of has matured. All schemes pending under the Sanitary Improvements Act did not succeed on account of this stumbling block in the way.

20288. The stumbling block is the preliminary survey ?—And the fact that money has to be paid by the people without any certainty that the scheme would be successful. I think Mr. Gupta has written a long note on that.

20289. You have got *utbandi tenures* ?—Yes.

20290. You have got produce rents and fixed money rents ?—Generally speaking, we have got money rents, but there are produce rents also. There is a proposal, I hear, to allow tenants to get their rents converted into fixed money rents.

20291. You think it is desirable ?—Yes.

20292. You are not in favour of produce rents, so far as the cultivator is concerned ?—I am not.

20293. So far as they affect improvement in agriculture also ?—Yes.

20294. You speak of compelling the zamindars by legislation to set apart a certain area of land for grazing purposes ?—Yes.

20295. Why do you make that suggestion ?—Because no land is available for pasture. The zamindars ought not to derive the entire benefit from the land ; they must set apart a certain portion for the benefit of their tenants.

20296. To benefit the tenants the zamindar gives the land on rent and the tenant grows paddy ?—But he gets rent from him. I say he must set apart a certain quantity of land in the village without any rent.

20297. Without any rent ?—Yes.

20298. *The Raja of Parlakimedi:* Even then, do not the cultivators encroach upon the land ?—All land has disappeared.

20299. So there is that practice of encroaching upon available land whether it is admitted or not ?—At present there is no such land, and therefore no encroachment can be made.

Every periodical survey discloses encroachments even on village commons and communal *porambokes.*

20300. *Dr. Hyder:* Is your department interested in fisheries ?—To a certain extent, but not as much as other districts. Nadia is not a riverine district.

20301. Coming to the welfare of agriculturists, you say that the tenancy law and the rights of zamindars to absolute ownership act as a hindrance to agricultural improvements ?—You mean consolidation, or what ?

20302. I ask you to look at page 180, Question 24. Tell me whether the majority of your tenants here, not the *utbandi* tenants, enjoy occupancy rights ?—Yes.

20303. Therefore, if the tenant had a fixed money rent, he is free to grow the improved varieties of crop ?—Yes.

20304. There is no hindrance either of the Tenancy Law or the law of absolute ownership in that case. Can you tell me any other matters in which these things operate as a hindrance ?—Under the Tenancy Law, as it has been interpreted by the High Courts, a tenant cannot excavate a tank in a land which he has taken for raising crops only. That stands in the way of his making improvements for irrigational facilities. He cannot even make a *pucca* house upon his own land.

20305. You cannot erect a house on land belonging to somebody else ?—Why not ? I am the occupancy holder. Why should I not be allowed to erect a structure upon my occupancy land ?

20306. *Sir Henry Lawrence:* Is there any proposal to give the tenants these rights by law ?—Not to my knowledge.

20307. *Mr. Gupta:* Is not the Tenancy Act under modification now ?—Yes, but we do not know in what form it will come out.

20308. The matter is under the consideration of Government ?—Yes.

20309. *Dr. Hyder:* You say the people of your district are not in favour of direct taxation. You advocate tolls. What is that, direct or indirect taxation ?—Indirect.

20310. How will you levy it ?—Whenever a bridge is made upon a certain road a certain amount will be levied as a toll on any cart, motor car or other vehicle that passes over it.

20311. Who will pay it ? Will it be the cultivator ?—The carter or the man who passes.

20312. He must be an agriculturist ?—Not necessarily.

20313. Your *bhadralog* would go scot-free ?—Certainly not, everyone would pay.

20314. The tolls would fall chiefly either on carts belonging to the agriculturists or motor cars belonging to *bhadralog* ?—No. Even pedestrians will have to pay one pice or two pice ; a motor car will pay Re. 1 ; a cart 4 annas. It will be graduated, and every one will pay.

20315. You advocate this on account of the peculiar circumstances of your Presidency ; otherwise you are not in favour of the system of tolls ?—Except for those specific work I am not for any tolls.

20316. On page 181 you say, " *Bhadralogs* would not come back to villages unless the communications are made easy ; unless they come back, permanent improvement is not possible." I ask you, although you have told me already, whether these *bhadralogs* possess lands ?—Some of them do possess land, but they let them out now to tenants.

20317. Do you think these people who own land would improve agriculture if they went bank to the villages ?—Yes ; they would spend money on land as on many other things.

20318. *Mr. Gupta :* As Dr. Hyder has pointed out, you have got various suggestions to make about the material and moral progress of your district. The Commission is primarily engaged on the question of agricultural improvements. Do I understand that educated Bengal would not favour a certain amount of local taxation if it were necessary, if it took the form of a consolidated tax for the various objects you have mentioned and if a certain amount of aid from the State was promised to supplement it ? I do not suggest that separate taxes should be levied for each and every improvement, but I suggest a consolidated rural improvement tax for sanitary improvements, elementary education, agricultural improvements, etc. A pleader like you, an educated man of your type, will surely realise that your scheme will not receive any attention unless you support it with proposals to finance it. Now take the road cess, for example. What is the incidence of that cess ?—Six pies in the rupee.

20319. Supposing another twelve pies were levied, would that be objectionable ?—Yes.

20320. Would you take up the inflexible position that you do not want to pay anything more ?—My personal view would be one thing and the popular view would be quite another.

20321. You are giving your opinion here. The popular opinion may be any way ?—As a matter of fact, when the educational scheme of Mr. Biss was put before me, I supported it. Mr. Biss said that people ought to pay something and he calculated that three pice per head would cover the additional educational expenditure. But that is my personal opinion.

20322. That is your personal opinion ?—Yes, If you want to make any improvement you will have to pay for it. That is my personal view, but I ought to tell you at the same time that popular opinion would not support me.

20323. No people in the world really pay taxes without grumbling. But once they realise the necessity of it, they gradually become reconciled to it. The example has to be set by leaders of public opinion like yourself ?—Yes.

20324. You would personally favour such taxation provided there are not separate taxes, the tax is not excessive, and the State supplements it. Is that the position ? —Yes.

20325. *Mr. Gupta :* Is that going to be a district tax the entire benefit of which will go to the people of the district ?—That would be more preferable.

20326. Of course that is what I meant. If the people see that they are getting something back for the money they are paying they may be reconciled to it, just as in the case of tolls. If the tax is centralised and the benefits come back to them in a form they do not understand, there would not be any willingness to pay it. Therefore there would not be any insuperable difficulty in collecting a district tax ?—At least there ought not to be.

20327. About the question of demonstrators, you are very anxious, and in my opinion rightly, that there should be more demonstrators. Mr. Finlow has told us that their scheme is to have a demonstrator for each *thana*; at present you have only one for each sub-division. Meanwhile, would you agree to Union Board Secretaries acting as demonstrators until we get the demonstrators ?—Yes, certainly.

20328. Turning to the jute seeds, you stated that they were a failure ?—This year I had some difficulty about the *Chinsura green* seeds.

20329. Did you get them from Dacca ?—No. I heard that 100 maunds of *Chinsura green* seeds were in the hands of the Collector. I at once wrote to him whether he could supply me some portion of it. He referred me to the District Agricultural Officer, and I wrote and asked him if he could give me some. He told me that he had got the consignment from Midnapore and asked me whether I was prepared to take it, and I said I would.

20330. You got it through the Collector ?—I wrote to the Collector as President of the District Agricultural Association.

20331. It was only this year ?—Yes.

20332. You did not grow it ?—Not everywhere.

20333. Was it put in anywhere ?—Yes.

20334. You said you had a farm, and you said you lost. You are in favour of a mixed dairy farm ?—Yes, on a co-operative basis.

20335. And on purely commercial lines ?—I cannot say as yet. We have only 54 *bighas* of land. My idea is that we should extend the co-operative movement to spheres other than mere credit supply. We want also good milk. Therefore, my idea is to introduce the co-operative principle to dairying and agricultural development.

20336. You are going to have a mixed farm ?—Yes, mixed farm.

20337. Your previous failure has not damped your enthusiasm ?—It has not.

20338. You agree with me that in opening out suitable occupation for middle classes, there is no sphere in which their prospect is so great as in agriculture ?—Yes, and also industry.

20339. *The Raja of Parlakimedi*: On page 176 you say that institutions for agricultural education are not sufficient ?—Yes.

20340. Are you sure that an increase in the number of institutions for agricultural training will induce people to take to agriculture as a profession ?—I have already said that all these things must go hand in hand. We cannot produce teachers and then make improvements in agriculture. The practical side of agricultural education must be given greater attention to.

20341. Would you restrict recruitment of students to those institutions to people who actually take up cultivation as a profession and to people who possess lands ?—I do not wish to restrict it in any way. Those who come out of these schools may set up farms on their own plots.

20342. Are you aware that there are institutions in other Provinces and graduates of those institutions do not take up farming but are after appointments ?—It might be because agriculture does not pay. It has not been shown neither do we see that agriculture, as a profession, is paying. It is for that reason that they go out for jobs to other places.

20343. They may not be taking a personal interest in the matter ?—I do not think so.

20344. Have you tried yourself personally that agriculture does not pay ?—I said I started a farm myself, there was a loss and consequently I gave it up.

20345. That is not the experience in other parts ?—It might be that is my unfortunate experience.

20346. *Sir Ganga Ram:* Did you cultivate yourself ?—I engaged labourers for it.

20347. You directed them how to cultivate ?—I did not myself know how to cultivate. I left it to them.

20348. *Mr. Gupta:* In that case, I suppose one of the best things the Agricultural Department can do is to demonstrate in practice that model farms of 200 acres can pay. That would be an excellent thing for everybody ?—This is exactly my point.

20349. *Mr. Kamat:* Were you farming while you were conducting your legal practice ?—Yes.

20350. You were doing both simultaneously ?—Yes.

20351. *Sir Ganga Ram :* In whose hands is the farm of yours now ?—I have given it up ; I have let it out to tenants.

20352. Have you transferred your land to them ?—They cultivate it themselves. The difficulty for the *bhadralogs* to take to agriculture is this. Supposing I engage two labourers, they do not take any interest in the produce ; they sit idle for the best part of the day, and whenever I go there they stir about and show to their master that they are doing something.

20353. What rent per year do you get ?—Rs. 12.

20354. From 200 *bighas* ?—From 200 *bighas* I get about Rs. 50 to Rs. 60.

20355. But you said Rs. 12 ?—Rs. 12 for 30 *bighas* ; this is within the town, on which I started my own cultivation.

20356. How much of it is private land ?—I have let out the whole of it to tenants.

20357. How much ?—60 to 70 *bighas.*

20358. On that basis, are you prepared to give those 200 *bighas* to the Agricultural Department ?—Certainly I would ; or let the Agricultural Department come in according to the *bhag* system ; let the income be divided, I will take one-fourth and let the Agricultural Department take three-fourths ; I am willing to give the land free ; that will serve the purpose of showing to the neighbouring cultivators what can be done.

20359. *The Raja of Paralakimedi :* No man of education, if he went about carrying on agriculture on your principles, will make it work on a profitable basis ?—Why not ?

20360. He must take a personal interest in the matter ; he must make that a sort of primary object in life, and he must also be in touch with it ?—I have taken a personal interest in the matter, but there are many difficulties ; the land was fit for cultivation, but I did not get labourers for weeding, or other operations.

20361. *Dr. Hyder :* Are you a superior landlord or have you an inferior interest ?—I hold a portion as rent payer ; it is *jamait* land.

20362. *Mr. Gupta :* You do not expect these young men to take to agriculture if they transact business in the same way as you do ?—It is not my fault ; it is the fault of the system ; we must change the system. Manure is not available ; there is no irrigation facility, the labourers are scarce. If you place these facilities at my disposal, even now I can show that I can make a profit out of it.

20363. You did not look after it ?—So far as possible, I did.

20364. *Sir Henry Lawrence :* Government should provide the labourers ?—No, the labourers are not available.

20365. By whom should these be placed at your disposal ; by Government ?—No, but manure and seeds should be made available.

20366. *The Raja of Paralakimedi :* You say in one of your paragraphs that there are no proper facilities available for taking to agriculture as a profession ?—Yes.

20367. May I know what are your suggestions in the matter of making it a prosperous profession ?—My point is that unless it is seen by boys of the *bhadralog* class, they will not take to it. For example, take any industry ; we see that some people are making money by taking to industries, and even though there may be chances of failure, the sons of the *bhadralog* class take to it. Take the profession of law ; simply because some of them become rich, others also take to that profession in expectation of becoming rich, whether they become successful or unsuccessful. Let us see some ventures on agriculture, which will show that by adopting certain methods or expedients we may become rich.

20368. You must believe me when I say that I took up a farm under my personal supervision, and in the very first year, after treating my labourers and everybody else concerned very liberally, I got a clear profit of Rs. 2,000 ?—How many *bighas* of land was it ?

20369. One hundred acres of land ?—That is 300 *bighas*, according to our standard. Lands here are rather bad, I should say.

20370. You will have to investigate in which way you have to enrich the land ?—That is exactly what I have expressed.

20371. You must place yourself in touch with the department ?—But the departmental staff is not sufficient.

20372. They can give you very good advice if you only keep in touch with them ?—Even for myself, I could not get them ; there is one demonstrator, and he has to go round the whole sub-division ; there was no demonstrator at the time I started farming.

20373. For you no demonstration is necessary ; you can read about the experiments that are being carried out in the department, and the department advise you what to do ? —Practical advice is one thing, and theoretical knowledge is another.

As far as manures and other things are concerned, the educated man requires no demonstration.

20374. On page 176, you say, " In order to do so, scientific methods of modern improved agricultural production, of converting raw agricultural produce into finished products which will find market both in and outside the country should be taught to them by actual demonstration ". In regard to that, I should like to know what crops you would concentrate upon. You must demonstrate ?—Yes.

20375. So that it may be lucrative ?—Yes.

20376. How would you go about it ?—I do not quite follow.

20377. *Mr. Gupta :* What kind of demonstration do you want ?—Suppose I have got a plantation of 50 *bighas* of bananas. I cannot sell all the produce at the local market ; we must convert it into finished products, and send them to other places for sale.

20378. *The Raja of Parlakimedi :* Who is to do that ?—Of course we have to convert it into finished products, but we have no machinery, and I do not know how it is to be done.

20379. *Sir James MacKenna :* What is the banana as a finished product ?—*Suttee* food is manufactured out of it and certain other things, I have read that in other countries raw materials are converted into certain other finished products. Take dairying for instance. I may start a dairy and I may produce 4 or 5 maunds of milk, but the whole amount may not be consumed in the town of Calcutta ; you must convert it into cheese, tin it and send it to other places for sale.

20380. *The Raja of Parlakimedi :* Are the co-operative societies handling any of these things ?—Not yet.

20381. In the Bombay Presidency such things are being done ; why do you not get the literature on it and try to do that ?—I say, therefore, that the co-operative movement should also be extended to these matters now.

20382. At present there is no such movement ?—I am going to start one venture in Ranaghat ; I have mentioned in my written answer that at Ranaghat a co-operative agricultural and dairy farm is shortly to be started ; the Department of Agriculture has promised to give me one demonstrator there and the Veterinary Department has promised to give me one Veterinary Assistant Surgeon.

20383. Again, you say that improved methods of cultivation and new crops should be introduced in those areas ?—Yes.

20384. Before doing that, do you not think that you must consider the climatic conditions ?—Certainly. I have also said that the suitability of the land should be first of all ascertained.

20385. Not only the land, but you must take into consideration the climatic conditions also. Indigenous methods of cultivation have been going on for ages together, and they have adopted certain crops for certain areas because they must be suitable to those places ?—Not necessarily.

20386. In the majority of cases it is like that ?—Of course, we must take all these things into consideration.

20387. So you may just as well include climatic conditions ?—Certainly. Take, for example, potato growing ; it was not in vogue in our part of the country, but potato growing is now extending. We are introducing new varieties which were not in vogue previously. So, we might test new varieties of crops, and if they are paying, or we can get better produce, we may take to them. If the climatic conditions do not permit of any particular crop being grown in any particular place, certainly I would not advocate its introduction.

20388. Is potato grown in this part as an irrigated crop ?—It cannot be grown in places where there is no facility for irrigation. There must be either a tank or a well at least the water of which can be used for the crop, and where these facilities exist potato is grown.

20389. In Nadia are there irrigational facilities ?—None up till now.

20390. *Sir Ganga Ram :* Is there no river ?—There is a river, but it is of no use for purposes of irrigation.

20391. *The Raja of Parlakimedi :* Is any cattle-breeding carried out in your part of the Province ?—Not in my district.

20392. In this Province, has not any private man taken up cattle-breeding ?—I know one barrister took to cattle-breeding and poultry keeping.

20393. Poultry keeping is different ?—Cattle-breeding is not usually taken up.

20394. We have been told that lack of pasture is the cause ; is that so ?—Yes.

20395. Who has encroached upon pasture land ?—Of course tenants ; but I do not know if there were pasture lands before. In my experience, I have never seen pasture lands in any village which have been subsequently encroached upon by tenants.

20396. It is extensive cultivation all along ?—Yes.

20397. Has it encroached upon pasture land ?—May be, if there were pasture lands before.

20398. They must have been waste lands ?—There are certain waste lands, no doubt.

20399. *Professor Gangulee :* Would you say that cultivation has extended in your district ?—No.

20400. *The Raja of Parlakimedi* : Then you say on another page of your memorandum that Government should finance these schemes. Government ought to provide money for demonstration and for improvements in agriculture ; otherwise it would neither be popular nor successful. How do you meet that demand upon Government funds ?—That is not for me to say, as to how Government should find the money.

20401. The only means left is to increase taxation ?—Increased taxation would be very unpopular in the country, but there are other means. People will say that the police charges might be reduced ; these are big political questions, and it is no use discussing them. They may raise some money by imposing some export tax on jute, but people are not willing to pay extra taxation ; that is the popular view. I can say this much that increased taxation will be very unpopular ; Government must seek other means to find the money.

20402. *Professor Gangulee :* Would you define ' popular view '? I find some difficulty in understanding the term ?—Popular view is the view of the people at large, those who pay.

20403. Would you include members of the District Boards among them ?—Yes, members of the District Board would certainly come under that category.

20404. This is the view of the members of the District Board ?—Yes ; I could not pass any measure for increased taxes through the municipality, and in the District Boards it will be the same.

20405. In the District Board, you are the only one in favour of it ?—I will be in favour of it as the last means ; if there is no other means it will have to be done.

20406. *The Raja of Parlakimedi :* In rural areas, what other methods would you suggest for improving demonstrations for the illiterate people ? You suggest the use of lantern slides and demonstration on Government farms. What other improvements do you suggest ?—Sending the demonstrators out to explain it to them personally.

20407. Do you not think that it is better to carry out this demonstration on their own lands ?—Certainly.

20408. And guaranteeing any loss that may be incurred ?—That is one of the best means, I should say.

20409. Would you include that as one of the best means in preference to lantern slides ?—Of course, as one of them.

20410. *Sir James MacKenna :* I just want to clear up one or two points about the seed given to you by the demonstrator and which failed ; was it jute or rice seed ?—This year it was jute and last year it was *charanak* paddy seed.

20411. Was this failure of the jute seed reported to the department ?—I wrote to the Agricultural Officer at Krishnagar.

20412. And he did not reply ?—He could not say anything more ; he asked me not to realise any prices from the persons to whom those seeds were distributed.

20413. Are you quite sure that all that jute seed was provided by the department ?—I did not say it was provided by the department ; I got it through the District Agricultural Officer.

20414. I understand that the jute seed from Dacca is guaranteed ?—The seeds from Dacca were perfectly all right.

20415. Do you not think it would be better to approach the Director of Agriculture in cases like that ?—The quantity of seed which I got from the department was all exhausted, and still the demand for it was very great. I heard that there was some amount in stock at Krishnagar, and I wrote to the Collector asking if he could supply me with some quantity of seed ; he referred me to the Agricultural Officer ; I wrote to him and he sent me 15 maunds.

20416. My only point was that it was rather a serious matter for Dacca jute seeds to fail ?—They did not belong to that farm, and I do not blame them.

20417. Jute seeds from Dacca are all guaranteed ?—They are all right.

20418. With reference to your position as Secretary of a Central Bank, I should like to ask you a few questions. What is the capital of the Central Bank ?—It will be a lakh of rupees.

20419. How much of that is subscribed by the people in the territorial area ?—It consists of two parts, share capital and deposits ; the share capital would be about Rs. 10,000 and the rest of it consists of deposits.

20420. Is the share capital subscribed locally ?—Yes.

20421. As regards the deposits, some of which are local and some from outside, which would be the major portion ?—The major portion is from outside and the lesser portion from the locality.

20422. Is the major portion from residents of large towns in the neighbourhood?—Yes.

20423. To what extent are deposits made by rural cultivators and to what extent by the professional classes ?—Practically speaking, no deposits are made by the cultivators.

20424. Except through the society, practically all the deposits are made by the professional men living in the town ?—Yes.

20425. What rate of interest do you pay on deposits ?—Formerly we were paying 7 per cent. for one year and 7½ per cent. for 2 years, but now, because there has been an abundance of money lying stagnant in our hands, we have reduced the rates of interest, and we are paying 7 per cent. for 2 years and 6½ per cent. for one year.

20426. *Professor Gangulee :* You have a great deal of surplus?—Yes, we have a surplus in our hands. I am refusing deposits.

20427. *Sir James MacKenna :* Because you cannot utilise them ?—Yes.

20428. How many societies have you under your Central Bank ?—About 100.

20429. *Sir Ganga Ram :* One hundred in your district ?—In my sub-division ; under the Central Bank of which I am secretary at Ranaghat. I started with 12 about three years ago, and I have gone up to 100 now.

20430. *Sir James MacKenna :* From what class do the directors of your Central Bank come ?—There are 15 directors altogether ; three come from the towns, and the rest are representatives of rural societies.

20431. That is to say, the cultivating classes have more than 50 per cent. of the representation ?—Yes, more than that.

20432. And they have an equal vote in the annual meetings ?—Yes.

20433. *Professor Gangulee :* As you are a High Court Vakil, I suppose you stay in Calcutta ?—No, at Ranaghat.

20434. Who managed this farm of yours ?—I myself, practically.

20435. Did you take farm costings ?—To a certain extent, but I did not keep regular accounts.

20436. Do you understand what we mean by farm costings ?—Do you mean regular accounts of the expenditure and income ?

20437. The detailed income and expenditure ?—I did not keep accounts of the detailed expenditure.

20438. You yourself managed that farm ?—Yes.

20439. You ascribe your failure to various reasons ?—Yes.

20440. May I suggest your failure may have been due to bad management ?—I do not admit that.

20441. You say on page 176 that to your knowledge some agricultural ventures by sons of well-to-do men with fair capital and on a large scale have been failures. You know of other cases ?—I know of another case near Ranaghat where a sub-judge after retirement put one of his sons into agriculture, and he failed.

20442. What time did he get up in the morning ? 8 o'clock, perhaps ?—No. For myself, I am an early riser and get up at 5 a.m.

20443. On page 177 you say, " Their (*i.e.*, the farmers') colossal ignorance and illiteracy are the main causes of their conservatism." Do you mean to suggest that the cultivator in your neighbourhood does not know a good thing when it is shown to him ?—When it is shown to him he does.

20444. He has enough common sense ?—Yes.

20445. He may be illiterate, but he is intelligent ?—Yes.

20446. On the same page you set out the main causes of borrowing, and you are modest enough to put litigation last on the list as you are a lawyer ?—Yes.

20447. And you think litigation is not an important cause ?—There is misconception about it.

20448. How many cultivators, what proportion of the total number, really take part in litigation ? How many of them are involved ?—I can say from my own personal experience that not more than 5 per cent. of the agriculturists are litigants, and the peculiar fact is that those who are litigants are always litigants, and those who do not come to the court never come. You see the same men coming to the court every month.

20449. From the amount of wealth pouring out of the High Court in this country into the pockets of the lawyers, one imagines the figure must be more than 5 per cent. ?—It may be, but it is not much more, so the general indebtedness of the agriculturist cannot be ascribed to litigation.

20450. So you put litigation last. I say that is modest on your part ?—From my own personal experience I can say that the money which goes into the pockets of the barristers does not come from the cultivators, but from people like traders, merchants and big landlords. The major portion of it comes from such people. The Calcutta barristers make their money out of the Marwaris, who are engaged in commercial transactions, and people like that.

20451. You say the remedy lies in the spread of co-operative societies which lend money at a very low rate of interest. Do you mean to suggest lower than the existing rate ?—Yes.

20452. What is the existing rate charged by co-operative societies ?—9 to 12 per cent.

20453. Can you reduce the rate of interest ?—We are not in a position to reduce it.

20454. From what class do the moneylenders in your district come ?—They are small traders.

20455. And small landlords ?—Yes.

20456. Any pleaders ?—No.

20457. They do not lend money ?—No.

20458. Is there a demonstration farm in your district ?—No. One is going to be started, but it is not in existence yet.

20459. Have demonstrators from the Department of Agriculture visited your district at any time ?—Yes, there is one posted at Ranaghat.

20460. We understand these demonstrations are given on the lands of the cultivators ?—Yes.

20461. When they are held, do you attend them ?—No.

20462. Have you been invited at any time ?—No.

20463. Did you ever come to know that the demonstrations were being held in the neighbourhood of your place ?—Yes.

20464. You are proposing to start a co-operative agricultural and dairy farm at Ranaghat ?—Yes.

20465. Who are going to be the members, urban or rural people ?—For the present we are getting urban people.

20466. So it does not affect the rural population at all ?—We are starting it for demonstration to the cultivators. They cannot afford the money; it is the urban people who have subscribed the share capital, and you must take your directors from among those who purchase shares.

20467. Will it be in the town itself ?—Yes.

20468. You are not trying to get the farmers of the neighbourhood into the scheme ?—We have tried to sell shares amongst them. It is about to be started; it has just been registered.

20469. This society you propose to start is really an urban society ?—Yes, for the present.

20470. With regard to the average cultivator working 300 days a year, they must be very prosperous in your district and have no need of subsidiary occupations. Can you tell us how you arrive at that figure of 300 days a year ?—Yes. During one month in the year there is very little for them to do, and I have put down also certain days in other months. I have inquired into the matter, and from my inquiries I think 300 days is the right figure.

20471. It is really a guess ?—Yes.

20472. Do you think there is any room for a subsidiary occupation ?—Yes, they have 65 days to spare in which they could do something.

20473. Are you a member of the Bengal Co-operative Organisation Society ?—No.

20474. Are you a member of any co-operative society ?—Yes, I am secretary of one society and I am a member of the Bengal Provincial Bank.

20475. Is your society federated with the Bengal Co-operative Organisation Society ?—Yes. That society does propaganda work, and it was only started this year, or rather only put on a systematic basis this year.

20476. It has been going on for some time ?—It had no statutory or legal sanction, but now it has been registered as a co-operative society.

20477. Do you yourself take part in propaganda work for co-operation ?—Yes.

20478. To teach the people co-operative principles ?—Yes.

20479. In what way ?—Whenever I go to the mofussil I instruct the people how to start co-operative pasture grounds or manure stores.

20480. Do you watch the effect of your propaganda ?—Yes.

20481. Are you quite satisfied with it ?—I go once in six months. The impression I create disappears in a day or two, and that is why I say systematic efforts should be made.

20482. Precisely; that is what I mean ?—That is why I want more demonstrators and co-operative supervisors, to bring these things constantly before the people and induce them to take them up. We non-officials who have other work to do cannot be expected to carry on systematic work in that direction.

20483. You have no other non-official agency in your town to help you ?—No.

20484. No other influential gentlemen to help you ?—No.

20485. You say the difficulty lies in organising the societies and running them successfully, and you say energetic and enterprising people are not always available in rural areas. We all know that. Then you say "Government ought to make serious efforts in that direction." Do you mean to say Government should supply energetic and enterprising men ?—No, but I suggest Government should employ more supervisors under the Co-operative Department and more demonstrators under the Agricultural Department. That is my point.

20486. *Mr. Calvert:* You refer to the establishment of agricultural and industrial banks. Are you thinking there of any special type of bank, other than the co-operative bank ?—Yes, because co-operative banks at present cannot advance more than ten times the paid-up share capital; that is under the Co-operative Societies Act.

20487. Under the rule ?—Yes. There are certain possibilities of the failure of these enterprises in the beginning. If the co-operative banks advanced more than that, the money of the depositors might be lost and the confidence of the people greatly shaken; but if these big banks are established and they finance these enterprises, their stability would not be affected, and consequently I suggest these agricultural and industrial banks should be established to finance these societies.

20488. What kind of constitution would the agricultural bank you contemplate have ?—They would be big banks where money could be had by the agriculturist.

20489. Where would their capital come from ?—The Government might raise it, or they might be a part of the Imperial Bank. I have not worked that out, but it might be under Government supervision or Government might find the money to establish these banks.

20490. An agricultural bank would depend on the public for deposits ?—Yes, to a certain extent it might.

20491. What could an agricultural bank do which a co-operative bank cannot do ?—If the paid-up capital of a co-operative bank is Rs. 200, the Central Bank can advance only Rs. 2,000, and with that amount a big commercial farm cannot be carried on.

20492. A co-operative bank adopts that rule for its security ?—Yes.

20493. Would the agricultural banks take risks the co-operative bank cannot take ?—Yes, because unless they take risks in the beginning nothing can be done.

20494. The bank would take business considered too risky for a co-operative bank ?—Yes.

20495. Whose funds would they be lending for this risky business ?—There would be a Government guarantee, and if there was that guarantee people would come forward with money. Unless and until there is a Government guarantee and safety for the depositors the money will not be forthcoming.

20496. Government would take all the risk ?—Yes.

20497. Have you thought out any scheme for the industrial banks you propose ?—Just as there would be agricultural banks so there would be industrial banks, and their funds would also come from the same source.

20498. From Government ?—Government guarantee. If there was a Government guarantee the Government could, through its officers, look after these agricultural and industrial ventures, and if there is Government supervision in the beginning over these enterprises we expect they will be a success. Private ventures are likely to fail, and the consequence of the failure of these enterprises would reflect on the banks and the whole thing would collapse. My idea is, therefore, that there should be stable agricultural and industrial banks which would not be shaken by failures in one or two cases in rural areas. These banks would be able to stand a few failures, and if you start 100 enterprises it cannot be expected that they will all fail. Some will fail and some succeed. We want these banks established in such a way that one or two failures will not affect their stability.

20499. The correct conception of an industrial bank is a bank with very large shares, say of Rs. 1,000 each, and it is the share capital that is lent out and not the deposits. There are no funds other than the share capital. Is that the kind of bank you are contemplating ?—No.

I ask that because the only people who have made a success of industrial banks of that type are German Jews.

20500. You suggest that night schools should be opened ?—Yes.

20501. Have you yourself tried to open them in Ranaghat ?—No.

20502. Do you think there is scope for them ?—Yes. I have seen some night schools in rural places. In a rural place I have found at dusk adults and even small boys going to take lessons.

20503. You are hopeful that propaganda there would be a success ?—Yes.

20504. I am glad to hear that. Coming now to the causes of borrowing, do you think the moneylender with capital for which he is trying to find an investment is one of the causes of borrowing ?—No.

20505. You do not think the moneylender is a cause of borrowing ?—No, I do not think people borrow simply because money is available.

20506. In pre-British days, there was practically no debt as we know it now, because there was no money to lend ?—I am not quite sure of that.

20507. Not on the same scale ?—I do not think debts were non-existent. It may be that owing to their producing good crops cultivators had not the same need of assistance.

20508. Do you think dishonest accounting is common among moneylenders ?—I have heard the allegation, but I do not say it is always true. It may be true in some cases, but not as a general rule.

20509. Have you never found thumb-marks on blank sheets of paper ?—In some cases, but not as a general rule.

20510. You mention you would not like to do anything which would have the effect of diminishing the value of land ?—Yes.

20511. Is it your experience that the rise in the value of land has preceded the rise in debt ?—I cannot say whether the rise in the value of land or the debt came first.

20512. Do you think the rise in the value of land is a cause of borrowing ?—No.

20513. With regard to consolidation of holdings, I do not wish to underestimate the extreme difficulties in Bengal, but have you read Mr. McLean's little note on the Punjab system ?—Yes.

20514. He mentions there a village called Chomo which it took two years to deal with, and he explains that at the end of two years the owners wished to begin all over again. Do you think you could do a village here in two years if really skilled men were at work ?—I think we could.

20515. You think you could get results with really trained men with sufficient patience to overcome the difficulties ?—Yes.

20516. Are your District Boards allowed to spend money on propaganda in favour of co-operation ?—No.

20517. Is it your experience that these repayments to primary societies are really fictitious ? Are they in cash ?—Yes.

20518. You know the common system is to repay a loan and borrow a fresh loan on the same date ?—Not always ; so far as my experience goes it is not that.

20519. Repayments to your Central Banks are quite proper repayments and not fictitious ?—Not fictitious.

20520. There is no question of going to the moneylender and repaying the debt and three days after taking another loan ?—At least that is not my experience.

20521. In your general meetings of your Central Banks, do you get a fair attendance of representatives from primary societies ?—Yes.

20522. Are they treated exactly as politely as any other members ?—Yes.

20523. There is no distinction between the seating accommodation allowed to the individual members of the town and the seating accommodation allowed to the primary societies ?—Of course benches are given when chairs are not available. Except that, they are not treated in a different way from the town members.

20524. Do they know how to exercise their voting power ?—Of course, they are gaining experience in the matter gradually. We see every year some change in this. They are really taking an interest in exercising their vote.

20525. What is the language in your meetings ?—Bengali.

20526. Do you prohibit the use of English entirely ?—There are some who do not know English and consequently we are bound to speak in Bengali and even in general meetings, for instance, when Mr. Graham, the Collector presided over the last meeting, we carried on the entire discussion in Bengali.

20527. *Professor Gangulee :* Are your accounts kept in Bengali ?—No, the Central Bank accounts are kept in English, but the rural society accounts are kept in Bengali.

20528. *Mr. Calvert :* Do you think it would be beneficial to your movement if Government provided a staff of highly trained economists who would teach villagers co-operation and village economics and things like that and try to explain the cause of poverty in the village ?—Yes.

20529. On the question of village roads, the trouble I gather, is that you are trying to finance your roads out of your current revenues ?—Yes.

20530. Now would it be possible in your own case to construct the roadway, the earth work and the bridges and so on from a loan and only pay for the wearing coat and sinking fund from revenue ?—Yes ; the cost of the road consists of more or less permanent expenditure on earth work, bridges and things of that sort.

20531. And your current expenditure on the wearing coat, etc., that is to be renewed every three or four years ?—Yes.

20532. Would it be possible to pay the capital from current revenue by keeping a sinking fund ?—We cannot meet that if it is from the current revenue unless we realise the whole amount, including the maintenance charges also from the tolls ; or loans

will have to be raised in order to make those improvements; but we will have to realise the amount which will cover also the maintenance charges because the greater the range of the *pucca* roads, the greater is the responsibility thrust upon the District Boards to maintain them. With the present funds at our disposal it is not possible for us to maintain all those roads in proper condition; and if we increase the mileage of roads it will be still more difficult to keep them in proper condition with the funds at our disposal now.

20533. *Mr. Kamat:* I have no desire to ask you any personal question because I do not think it will be fair to you. But I want to elucidate the outlook of educated men in this Presidency by one or two questions which have a positive bearing on the environment. In addition to your profession, you are devoting part of your time to the co-operative movement, are you not ?—Yes.

20534. And therefore you come in contact with the rural people ?—Yes, and also as Chairman of the District Board I come in contact with them.

20535. As such you devote part of your time to rural welfare ?—Yes.

20536. And you know their practical difficulties ?—Yes.

20537. And you think the country requires far more men, with all the limitations of time and other things, to work for the welfare of the people ?—Yes.

20538. And in this matter of the rural work, in the long run this kind of help really advances the movement rather than sitting in the country ?—Certainly, it does.

20539. Now about your outlook, you were saying that you had no money for road communications and that stood in the way of the *bhadralog* going to rural villages and such like things. Would you suggest a remedy for it ?—Yes, I have suggested it in my note.

20540. Do you think the agricultural income of the people of this Presidency is going up or is it stationary ?—That would depend upon the produce from year to year.

20541. Is it going up, according to your information, or going down ?—I should say that it is going down; that is my impression.

20542. Looking to the seasonal reports, I want to bring to your notice that in your district, taking the question of jute, the normal harvesting price was Rs. 4-13-0, whereas the year before last it was Rs. 12 or nearly three times as much. Last year it was Rs. 20 or five times as much. In the face of that, do you think that the agricultural income of the Presidency is going down ?—Yes, in this way; this year it was Rs. 6 and last year was a very prosperous year. Therefore I have said that it will depend on the produce of the year and jute is not the only crop we have. It is a small proportion of the crops that are grown.

20543. Can you show me any crop which has gone down ?—The cost of wages has increased; the cost of cultivation has increased; the fertility of the soil has decreased and the produce has been less. That is my impression.

20544. And you think the income of the people, therefore, is less ?—Yes.

20545. Have you looked into the other question whether your Presidency is contributing sufficiently towards the welfare of the public and whether it is properly taxed ?—I think it is properly taxed.

20546. You know the general revenues of your Presidency ?—Yes, to a certain extent.

20547. They are about 10 crores ?—Yes.

20548. Have you compared that with other Presidencies and with their population ?—No.

20549. In Madras it is 16 crores and in Bombay it is 16 crores. Do you know how it works out ?—How ?

20550. According to your population you are taxing yourself only Rs. 2-8-0 per annum. The Madras man taxes himself to Rs. 4 and the Bombay man to Rs. 8 ?—Have you also taken into consideration their income from land, whether it is more or less ?

20551. This is income from everything ?—That is taxation per head you say. But what is the income ? The capacity to pay the tax depends upon the income of the particular cultivator in each Province. I may pay Re. 1 as tax and I may consider myself having regard to my income or to the other taxes I pay, to be heavily taxed. But a man paying Rs. 4 may not be considering himself to be over-taxed.

20552. *Mr. Gupta:* Is it not a fact that the revenue of this Province is 32 crores of which 22 crores go to the Central Government as contribution from this Province, and not 10 ?—I do not know exactly what it is.

20553. *Mr. Kamat:* I am dealing with provincial revenues and we have nothing to do with what Mr. Gupta has said. You therefore think there is no scope for further taxation ?—Yes, that is my opinion.

20554. As the Chairman of a District Board you said in answer to Mr. Gupta that personally you were in favour of raising the taxes ?—I said they could be raised, that is my opinion. If all these improvements are to be made the people must pay something, otherwise they cannot have them ; they cannot sit idle.

20555. Mr. Gupta asked you, subject to certain provisos, one of which was that there should be State aid, whether you would be willing to tax yourself and you gave that out as the educated public opinion in this Presidency ?—That was my personal view ; but I said that people would object to it.

20556. Were you returned by the people as Chairman to the Board or were you nominated by the Government ?—I was elected as Chairman by the District Board, but nominated as member of the Local Board.

20557. And I take it, therefore, you are a popular man ?—Yes.

20558. And you represent the popular mind ?—To a certain extent, yes.

20559. If you represent the popular mind, would you attempt to bring a proposa. in the District Board to have some cess levied so as to bring in more income ? Could you venture upon it ?—No, because I do not think it is possible to carry it through.

20560. You would simply follow public opinion and not put before the public your personal opinion ?—Yes ; I would not be able to carry it through.

20561. And therefore for sometime you would not venture to touch the question of additional taxation for all the reforms which you want ?—At least I would not be able to carry it through.

20562. Would you attempt it ?—Even if I attempted it, I would not be successful.

20563. Supposing some people are in favour of it and ask you, would you attempt it, would you test public opinion ?—Yes, I might ; but you see there is a good deal of unpopularity about all these matters. I know perfectly well that people will not support me. So knowing the position fully well, why should I incur any unpopularity by doing it when I have no chance of carrying it through ? If I know that there is a substantial majority in favour of my proposal, I should attempt it. But knowing fully well the will of the people there is no use attempting it.

20564. *Professor Gangulee :* In other words, you will not attempt to create a public opinion ?—That is not it. The public opinion is stubborn on that point. I know it is difficult to influence public opinion on that point.

20565. But when you went to the electorate and got their votes, did you express your personal opinion ?—No, that question did not arise at all.

20566. You do not think it worth while to bring this personal opinion to their notice ? —That question did not arise at all, you see.

20567. *Rai Bahadur Bannerji :* Just a few months ago when the idea of having free primary education was in motion in the country, the Divisional Commissioners had a conference in which the representatives of District Boards were invited to give their opinion as to whether the educational cess of one anna or one anna and a quarter per rupee would be acceptable to them. What opinion did your District Board give ?—They did not agree to it ; I think they dropped it.

20568. *Mr. Gupta :* What opinion did you give ?—Of course in the Municipality I gave my opinion and did make an attempt really speaking ; but in the District Board I do not remember what I said, but really speaking I said, in effect, "You cannot sit with your hands idle. If you want these improvements, you will have to do something". It was a cry in the wilderness.

20569. It has nothing to do with this ; it is more or less a scheme ?—Taxation in whatever form would not be acceptable to the people.

20570. *Rai Bahadur Bannerji :* Supposing a bill were introduced in the next Bengal Legislative Council and you were a Member of the Council, what would you do ? Would you support the measure ?—I said already that it was a very delicate question. There is one personal opinion and another, the opinion of the electorate which I am bound to obey. It is not yet certain as to whether a Member of the Council would give his own personal opinion or whether he would voice the opinion of the people whom he represents. If I am there to represent the views of the people I should say 'no' to that ; and if I am to give my own personal opinion I should say that a certain small proportion should be paid by the people, provided that the other portion comes from the Government.

20571. *Mr. Calvert :* What is the meaning of the phrase 'Leader of the people'?—'Leader of the people' has different meanings. It has no meaning properly speaking. People are not now led by one man. The leader is thrown overboard as soon as the leader goes against the wishes of the people.

20572. That is the state of things nowadays ?—Yes, one day he is the leader of the people and the next day he is nowhere because he ventures to give vent to opinions which are not liked by the people.

20573. *Dr. Hyder :* What will he do if he wants business ?—He would be nowhere, I tell you. The leader of the people would be gone at once.

20574. *Mr. Gupta :* Your income of the District Board, as you said, is from roads cess and public works cess ?—I say the main heads.

20575. Now the money that you get from the public works cess has to be spent on education, sanitation, water-supply and similar objects ?—Yes.

20576. And the money you get from the roads cess has to be entirely spent on the construction and maintenance of roads, has it not ?—Yes ; that is right.

20577. You say on page 178 of your note 'By offering a substantial price to owners for cowdung and making other kinds of fuel cheaper and more easily available than at present'. What other kinds of fuel had you in your mind when you wrote this note ?—Fire-wood which is not available ; and coal.

20578. Or soft coke ?—Yes.

20579. How can you make soft coke cheaper than what it is today ?—That I do not know of course, but that is the only way. Otherwise, the poor people will not part with their cowdung.

20580. Cannot soft coke be made cheaper if the owners of the coal mines reduce the prices or if the railway company reduce its railway freight ?—Certainly.

20581. *Sir Ganga Ram ;* What is the value of your land ?—That differs at different places.

20582. I ask you about your land ; you have got 200 acres ?—40 *bighas* and I purchased it for Rs. 400, at Rs. 10 per *bigha*.

20583. Rupees 10 per *bigha* ? You can get land at that price ?—Yes.

20584. Is that the general price ?—Of course cultivated lands generally vary from Rs. 10 to Rs. 25 a *bigha*. A *bigha* is one-third of an acre.

20585. That means Rs. 30 to 60 an acre ?—Yes.

20586. What is the wage of a labourer ?—Nowadays it is increased to 12 annas per diem.

20587. The ordinary agricultural labourer ?—Yes.

20588. Can you get sufficient work for that man ?—People engage them at that rate.

20589. In urban or rural areas ?—In urban areas.

20590. Twelve annas ?—Yes.

20591. A mason for instance ?—A mason, if he works for 8 hours will get Rs. 1-2-0

20592. Otherwise ?—He would get 12 annas.

20593. The same rate for a mason and an ordinary labourer ?—No ; I say it is Rs. 1-2-0 for the mason.

20594. But ordinarily it is 12 annas ?—Yes, 12 annas for the ordinary labourer.

20595. Is that the only difference between the mason and the labourer, Rs. 1-2-0 and 12 annas ?—Masons are only used for constructing buildings ; there are also labourers engaged for that purpose.

20596. *Sir Ganga Ram :* You are thinking of starting a dairy ?—Yes.

20597. Have you considered what you will do with the useless animal, the cow that goes dry ?—We have not decided upon that particularly, but we will take expert advice upon that.

20598. Upon that question ?—Yes.

20599. *Professor Gangulee :* The butcher is the expert ?—Not exactly ; we may consult outside experts. We have not decided upon that ; these are details which will have to be decided by experts.

20600. *Sir Thomas Middleton:* I am much interested in your evidence. We had some difference about the question of the qualifications required for recruits to the Agricultural Department. Do you now agree with me that improved agriculture is a most difficult process, wanting knowledge, skill and energy ?—Yes.

20601. Do you agree that it may even be as difficult a matter to be a successful agriculturist as to be a successful lawyer?—Yes.

20602. Do you agree that ability is abundant in the boys of Bengal ?—Yes.

20603. And they make good college students ?—Yes.

20604. Then, I ask you this. Is it not worth while to give good education up to the Intermediate standard to the boys to be recruited by the Agricultural Department, for the purpose of advising agriculturists ?—I do not wish to have a hard and fast rule on that point. I think Matriculation would be sufficient for those who would like to go to an agricultural class.

20605. But you are aware of the fact that at the Matriculation standard they have no knowledge of science ?—Yes. I have suggested therefore that from the very beginning agricultural subjects might be included in the curricula of the lower classes.

20606. That will mean an alteration in school curricula ?—Yes.

(The witness withdrew.)

The Commission then adjourned till 10 a.m., on Friday, the 3rd December, 1926

Friday, December 3rd, 1926

CALCUTTA

PRESENT:

THE MARQUESS OF LINLITHGOW, D.L. (*Chairman*).

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S.
Sir THOMAS MIDDLETON, K.B.E., C.B.
Rai Bahadur Sir GANGA RAM, Kt., C.I.E., M.V.O.
Sir JAMES MACKENNA, Kt., C.I.E., I.C.S.
Raja Sri KRISHNA CHANDRA GAJAPATI NARAYANA DEO of Parlakimedi.
Professor N. GANGULEE.
Dr. L. K. HYDER.
Mr. B. S. KAMAT.

Mr. J. N. GUPTA, I.C.S.
Rai A. C. BANNERJI Bahadur } (*Co-opted Members*).
Mr. J. A. MADAN, I.C.S.
Mr. F. W. H. SMITH. } (*Joint Secretaries*).

Mr. E. O. SHEBBEARE, Conservator of Forests, Bengal, Darjeeling

Replies to the Questionnaire

QUESTION 16.—ANIMAL HUSBANDRY.—(*a*) (*i*) and (*b*) (*i*). The best breeds of cattle are said to come from those parts of India and Burma where pasturage is scarcest. In Bengal grazing is cheap, often free, so that it costs next to nothing to own cattle which have come to be regarded almost as a form of currency. The result has been that the head of cattle has increased up to the maximum number that the available pasturage will support through the dry weather in a half-starved condition. The breed thus weakened has further deteriorated owing to promiscuous mating, often of immature animals, while any young bull showing promise is castrated and put to work.

The only remedy would appear to be to limit the head of cattle grazed and gradually to reduce this number while trying to improve the breed by selection. There are far too many cattle at present; America with three times the area of India has only one-third the head of cattle and is a milk and beef exporting country.

In the hills round Darjeeling, owing to the damage done by forest grazing, the Forest Department has gradually substituted stall-feeding by building cattle sheds surrounded by fenced paddocks in the forest and charging a nominal rate for cut fodder. It is not profitable to stall-feed poor milkers and the result has been an improvement in the stock kept. These paddocks can be seen from Darjeeling in half a day with a motor car.

QUESTION 19.—FORESTS.—(*a*) No. The *taungya* system, which has now been introduced into most of the Government forests of Bengal, has opened up possibilities of a considerable extension of cultivation.

Under this system, which consists in replanting clear-felled forest by the aid of agricultural crops, from $\frac{1}{40}$th to $\frac{1}{20}$th of the total area of the forest should be under field crops, the rotation of the forest crop being usually either 40 or 80 years and the field crops taken off each area for two years in succession.

The extension of the system since its introduction some ten years ago has been gradual, cultivators being slow to accept a novelty, and there are at present only 1,039 families living as *taungya* cultivators in the Government forests of the Province. The Forest Department is making every effort to increase their numbers as it is believed that the future forest wealth of Bengal lies largely in the even-aged plantations grown with their help.

A description of the method as carried out in Bengal will be found in *Indian Forest Records*, Volume VIII, Part IV, and the system can best be seen working at Rajabhatkhawa on the Eastern Bengal Railway (about 16 hours from Calcutta), at Sukna on the Darjeeling-Himalayan Railway (12 hours) or at Kaptai in the Chittagong Hill tracts (36 hours).

I do not consider any extension of forest grazing in Bengal compatible with the proper preservation of forest areas. On the contrary many blocks are overgrazed and ought to be closed. The great improvement in the Government forests of Northern Bengal since conservancy began has been principally due to protection from fire and grazing,

which in practice are inseparable. A comparison between two similar forests, separated only by a boundary line, the one protected from fire and grazing and the other not, can best be made at the 9th mile of the Siliguri-Sivoke road (12 hours from Calcutta).

The Forest Department encourages the cutting of fodder by charging a nominal fee and by building cattle sheds surrounded by fenced exercise paddocks. This applies only to the hills; stall-feeding is unfortunately not yet practised in the plains where the cattle are of too poor a breed to repay the trouble. These stall-feeding establishments can be seen from Darjeeling in half a day with a motor car.

(*b*) The only means of increasing the supply of firewood and fodder in rural areas away from Government reserves would appear to be the formation of village forests. In some parts of Bengal a certain amount of scrub jungle still remains which could with care be restored but, in most districts, any high land which exists would have to be replanted. I understand that some villagers in Madras have made plantations for their own use and protect them jealously.

At the request of the agricultural and civil authorities, I recently investigated some of the remains of forests in Western Bengal and, among other things, recommended that an attempt should be made to protect and improve scrub jungle in the interests of fuel and fodder as well as to conserve water and prevent erosion. The Collector of Bankura, working through the village co-operative societies, began some experiments in this direction; I cannot say at present how far he has succeeded in his extremely difficult task, or how far my advice proved of any practical value. The chief difficulty in an attempt of this kind is that, where everybody is at liberty to cut, burn and graze anything anywhere, the first steps towards improvement are bound to be in the direction of the curtailment of privileges.

(*c*) The destruction of forests in Western Bengal during recent times has brought about serious erosion and the drying up of streams and surface water within the memory of living people. The process is still continuing and these western districts appear to be tending towards almost desert conditions. At present the only means of conserving water for agricultural purposes is the damming of small valleys to form artificial reservoirs and occasionally by the cutting of contour ditches on the hill-sides.

In the moist sub-Himalayan tract the deterioration of head-water forests in the Kalimpong sub-division through overgrazing has caused landslips in the hills and floods in the plains below. In the Chittagong Hill tracts, the disforestation of the Maini valley led to the silting up of the Karnaphuli river and formation of sand-bars impassable except to the smallest craft.

(*d*) The shortage of moisture in the soil and damage by erosion are both symptoms of the same complaint, too rapid a "run-off." The remedy lies in what Americans call the "fly-wheel action of forests," that is to say, spreading the effect of short but violent storms and a short but heavy rainy season to give sufficient moisture throughout the year. The maintenance (or establishment) of an absorbent pad of forest on all hill-tops and head-waters is indicated.

(*e*) I have dealt with this under (*b*) above.

(*f*) Yes, in many places often because what appears to be light grazing in terms of the head of cattle per acre is, in practice, concentrated near the villages, in stream beds and grassy blanks; the last two being just where it does most harm. To quote from a recent review*:—"It is a shortsighted policy of Government to encourage this forest grazing. Cheap grazing only encourages large herds of useless half-starved cattle and ruins the forest." I think that the majority of agricultural and forest officers will subscribe to these sentiments, though some of them may say that, under existing conditions, some forest grazing is unavoidable. This is to some extent true and civil officers, who have the peace of their districts to consider, cannot be expected to favour sudden and drastic closing down of forest grazing over large areas which might lead to hardship or disorder. On the other hand, if Government agrees that cheap forest grazing is harmful both to the breed of cattle and to the forest, a policy of gradually increasing the grazing fees while keeping the rates for cut fodder nominal, could surely be introduced so as to discourage the practice without causing hardship to anybody. In one district where the rate for forest grazing is only one anna per head per annum, cultivators living away from the forest are said to pay landowners as much as eight annas a month for the same privilege.

* Review of the Central Provinces Administration Report in *Indian Forester* for November 1926.

Oral Evidence

20607. *The Chairman:* Mr. Shebbeare, you are Conservator of Forests in this Presidency ?—Yes.

20608. You have put in a note of the evidence which you wish to give and the Commission is greatly obliged to you for it. Do you want to make any general statement at this stage ?—No.

20609. I should like to ask you first whether you think that, having regard to the services that the forest areas can provide for agriculture, there is sufficiently intimate and active touch and interchange of opinions between your Department and the Agricultural Department ?—Yes ; we see a good deal of each other and we get on very well.

20610. Do you think your subordinate officers understand the extent to which forest areas can be used for agriculture under certain conditions ?—I think so.

20611. How would you regard the suggestion that suitable junior officers of your department should be attached for a short time to the Agricultural Department in areas where agricultural lands are contiguous to forest area, so that they might get some insight into the problem from the agricultural angle ?—All areas are contiguous to agricultural areas. I think it would be a good suggestion to accept if we had time. The trouble is that all these additional training schemes take up a certain amount of time ; I think that would be the only objection otherwise the idea is an excellent one. There are so many things that have been suggested. It has been suggested, for instance, that we should go round with the Settlement Officer for a time. That would be an excellent thing to do provided we had time. The difficulty is that we have not got time.

20612. Would you just tell the Commission how your forests in this Presidency are classified ?—What do you mean by classification ? You mean reserved and protected and so on ?

20613. Yes, just to be certain that the practice in this Presidency is the same as in other Provinces?—The important forests are reserved forests. Certain forests, which may be eventually required for other purposes or which have only been recently taken over, are classed as protected forests.

20614. Is the big timber in the reserved forest ?—Yes, the important forests are reserved forests. Some protected forests contain valuable timber. They have, of course, been taken over for a very long time. The rules regarding the protected forests are, one might say, more easy-going than those of the reserved forest. Then there are Unclassed State Forests in which cultivation is allowed such as broad tracts of land like the Chittagong Hill tracts where shifting cultivation is allowed. They are shown as Unclassed State Forests because we get some money out of a certain class of produce that is obviously not grown by the people.

20615. What measure of control have you over the operations of agriculturists in the Unclassed State Forests ?—We have none barring that certain reserved trees may not be felled and so on. As to where they should cultivate and where they should not are matters which are entirely in the hands of the Civil Department.

20616. That is to say, the trees of certain reserved species may not be cut down ?—That is right. They are allowed to cut any number of bamboos they may like and any other trees with the exception, I think, of about half a dozen.

20617. Have you Forest Panchayats in this Presidency ?—No.

20618. Are you familiar with the administrative experiments that are being made in that direction in other parts of India ?—I have never heard of them.

20619. You have not heard anything about the control of forests by panchayats ?—You mean like the one they have in Madras. I am afraid I would like to know more about it. I do not know much about it. I have just spoken to one or two Madras men about it. It sounds as though it is rather a good thing.

20620. Are there large tracts of forests in this Presidency which are owned by private persons ?—Yes, they are fairly large, although they are not as large as Government forests.

20621. Do large zamindars own fairly big forests ?—In Dacca and Mymensingh there are small areas of forests owned by private zamindars. In Northern Bengal also there are some privately-owned forests. The same is the case with Western Bengal in places like Bankura and Midnapore.

20622. Is grazing allowed in reserved forests ?—In some forests it is allowed.

20623. And grass cutting ?—Grass cutting is always allowed and everywhere.

20624. Is grazing also allowed in the protected forests ?—Some of the protected forests are open to grazing and some are not.

20625. But they are all open to grass cutting ?—Yes.

20626. Is grazing hired out in the private forests ?—I understand this is the case. Obviously the graziers must pay. I know of certain cases where it has been done.

20627. You have no control in or responsibility for the private forests ?—In Dacca we have responsibility now. We have just taken them over for the owners.

20628. At their desire ?—Yes, at their request.

20629. Supposing that serious denudation was apparent in a private-owned forest area as a result of too hard cutting, could you step in ?—Not unless I was managing the forest. In Dacca, of course, it is my responsibility. I am now managing the forest for them. I have got to do my best to protect their forests. But take, for instance, Jalpaiguri. They may cut it down to-morrow; I have nothing to do with it.

20630. Will you please turn to page 206 of your note. Your argument is that in those areas where fodder is most easily obtained the cattle are worst ?—I do not know enough about the whole of India to absolutely vouch for it. I am really quoting second-hand information from various authorities. At the same time it bears out what I have seen.

20631. I would suggest to you that in these areas fodder is plentiful at certain seasons but almost entirely lacking in other seasons ?—That is the case everywhere in India. There is bound to be much more fodder during the rains; but if you are grazing up to your grazing possibility, you are bound to have a time when it will run short.

20632. And the better thing to do for the cattle of the country is to store fodder ?—I have thought so all the time.

20633. Do you have fodder famines in this Presidency ?—You never see cattle dying like flies in this Presidency.

20634. So, there may be a dearth but never an absolute famine ?—No.

20635. Do you think there is any opening for the preparation of preserved fodder in forest areas to be sold to the cultivator ?—I think it would be an excellent scheme if it could be worked. I have no first-hand knowledge of it in our forests. It was done in Bihar and Orissa.

20636. If it were proved to be within the range of economic possibility, would you suggest that the Forest Department should undertake that work or that the Agricultural Department should do it ?—We would certainly like to have the advice of the Agricultural Department about it but the actual shopkeeper's part of the work should be our job.

20637. You do not want to see the Agricultural Department running about in the forests ?—I do not mind that. They run about even now. What I mean to say is that where it comes to rupees, annas and pies, I would like to have that under me.

20638. You are going to have the money ?—I do not mind that.

20639. Supposing it costs money, would you like to keep it in your hands even then ? Would it make it less attractive ?—Yes.

20640. *Professor Gangulee:* Why do the Agricultural Department run about in the forests ?—We ask them to come and give us their advice.

20641. *The Chairman:* On page 206, you talk about the *taungya* system. How long has that system been in operation in this Presidency ?—On a practical scale you might say six years.

20642. Only six years in actual operation ?—On the practical scale. The first experiment in that direction was made in 1908; we began to get on the right lines about 1914 and we put out the first reasonably big sized plantation in 1920.

20643. It is a matter of felling forests and allowing cultivation for two seasons. Is that the idea ?—That is broadly the idea. It means that you are working the forests on the uniform method.

20644. Can you get your heaviest timber in an 80 years' cycle ?—Yes, from 40 to 80 years.

20645. Is that, in fact, an attempt to control the practice of *jhuming* of timber ?—That was originally the scheme. It began in Burma when the problem of *jhuming* was very acute and it was very successful. Then it almost stopped in 1903. It has been started again in full force quite lately.

20646. *Dr. Hyder :* Have you been to Burma yourself ?—I have just been there to see and have a look round. I have never served in Burma.

20647. *The Chairman ;* What tribes are taking advantage of it ? Are they the tribes that are accustomed to shifting cultivation ?—Mostly our tribes are not shifting cultivation people except in Chittagong. I can tell you the tribes that do it now. Our best people are the *Garos*, the next best are the *Malpharies*, a tribe from Chota Nagpur, and the next best after them, I should say, are the hill men. All these people have been doing shifting cultivation fairly recently.

20648. You say you do not recommend any extension of forest grazing in the Bengal forests. Apart from the obvious point about animals nibbling off young seedlings, what is the harm done by too much grazing ?—It eventually causes a particularly hard irony surface to the soil which is perfectly unmistakable once you have seen it, and also certain weeds which are also unmistakable once you have seen them. Those two things together with fires, of course, seem to have a very bad effect not only on regeneration but also on standing trees.

20649. The fires being produced by the people in charge of the cattle ?—Yes. In good forests there is no good grazing. In places that are beginning to wear somewhat bare you can get grass in fairly easily; the grazing will bring it in by itself and if that grass gets burnt in the hot weather that makes a bigger patch still ; so eventually good forest can be turned into good grazing ground but it will not be very good forest after that.

20650. I understand what you say in answer to question 19, but do you think there is any opening for planting with trees reasonably good land not at present cultivated ?—Yes. I should say that all high land which is not paddy land will grow trees and that as the demand for dry crops is very small you could practically work the whole of the high land in Bengal under *taungya* on short rotation and produce much more forest than you have now and get as much dry crops as you get now. They are doing shifting cultivation now without getting any trees up.

20651. Do you think Government could control that in any way ?—I think the only possible way to do it is that Government (in the widest sense) should control it. I do not think the Forest Department could take over the whole work straight off and run it. You cannot take over large tracts of country where no one has ever seen a forest before and start close forest conservancy ; you will simply cause a riot. You have to approach the matter a little more carefully than that, and as we are not experts in the careful handling of situations, it is not our job. I think there are certainly places where we could take it on, but those are in the more out of the way districts ; where there is a certain amount of forest left there is also a certain amount of forest ownership worth holding on to, as in the south west corner of Bankura, for instance. There we could take over the forest by paying the man who owns it now and run it as a forest. But where it is a question of planting a little bit of high land alongside a village it is more than we could tackle ; it would take a certain amount of finesse, and probably a certain amount of brute force as well, before that could be done.

20652. Do you think if you had a special section chosen for tact as well as for drive they could take it on ?—Such a special section would not necessarily consist of foresters ; because all they would have to know would be a little plantation work. It might contain 10 per cent. of foresters, 40 per cent. of civilians and 50 per cent. of policemen.

20653. Have you ever worked out the economic side of any proposals of that sort?—Yes. In Bankura, I worked it out as far as it can be worked out. One can see it would be profitable, but it would be difficult to give exact figures for what a forest is going to be worth if it is looked after when one has only seen the bare shreds of it left.

20654. Do you think if the matter was examined and experiments made it might prove to be remunerative ?—Certainly.

20655. How long have you known Bengal ?—Since 1906.

20656. Has there been any deterioration of cultivable land during that time as a result of the over-cutting of forests ?—Yes ; in certain places there have been wash-outs which are caused by clearing forests. I should not like to say the main land had been affected, but there are enormous tracts which have disappeared since I have known them, as for instance, between Jalpaiguri and Barnes Ghat where there is nothing but sand now from end to end.

20657. How large is that area ?—It is 2½ miles wide. It goes up stream for 15 miles and I do not know how far down stream.

20658. That tract has been ruined in your time ?—Yes.

20659. Is that owing to shifting cultivation ?—Not exactly; it is owing to grazing all during the rains and quite good paddy cultivation in dangerous places. Perhaps it is hardly a case in point and I should give you an instance more obviously due to denudation of forests like the Chell river. There is a very large area there which has been carried away by the grazing in the forests in the foothills of Kalimpong. I think I have mentioned that in my note. The best examples are in Western Bengal, but I do not know much about that part of the country; I have only been there a couple of times to report. Any one from Bankura, Midnapore or anywhere round there could give you striking examples of what has happened in that neighbourhood.

20660. Do you think it is a growing difficulty ? Are you apprehensive about the future ?—It will go on getting worse.

20661. Do you suggest steps might be taken to check it ?—Yes. I think it would be much better to put all headwaters and tops of hills, if they are not used for growing paddy (and of course they are not in most cases), under forest or under forest and shifting cultivation, combined.

20662. Under control ?—Yes, of some sort.

20663. That would require a very much larger staff ?—It would.

20664. *Rai Bahadur Bannerji*: Would not it require a new law, because they belong to the zamindars ?—You would have to take them over in one way or another, either for the zamindar (which is the most satisfactory way in many respects because then the zamindar and yourself are on the same side) or by buying them from the zamindar, in which case he does not care what happens to them and you have him and everybody else up against you.

20665. But the zamindars have been converting those places into paddy fields ?—Where it will grow paddy it is better to grow it; paddy will always pay you better than forests. I am talking of land which is not paddy land.

20666. *The Chairman*: We have the figure somewhere, but what is your total forest area here ?—I have a note of it which I can give you.

20667. *Professor Gangulee*: 11,223 square miles ?—Yes, of which about 6,000 is reserved forest, which is the important thing.

20668. *Sir Ganga Ram*: 11,000 altogether ?—Yes. About 1,700 would be protected forest.

20669. *Professor Gangulee*: The reserved forest is about 5,288 square miles ?—Yes.

20670. *The Raja of Parlakimedi*: The protected forests are unreserved ?—They are reserved under another section of the Forest Act; that is the actual definition of them. If you look up the Act you will see there is a chapter for protected forests which allows you to take over the forests and look after them and prevent them being denuded and completely spoilt, but does not give you the complete control you have with reserved forests.

20671. In that area, do you protect the superior varieties of timber ?—Yes. You are allowed to gazette any species or in some cases all the species. We have sometimes reserved all the species in a protected forest, but that does not often happen; that would only be where there was particular danger of the land slipping, or that kind of thing. Ordinarily you protect only the valuable species but the Government of Bengal issues its own notifications under certain sections.

20672. Gazettes them ?—Yes.

20673. *The Chairman*: Do you think this large area of forest is capable economically of supplying the cultivating population with more fuel than it does at present ?—With much more than they take now. We are working up the business of sending it by rail, and we are sending more and more fuel down, by rail now. The difficulty is that in Bengal there is one lot of forest at one end and one at the other, with nothing in between. We can do nothing for the cultivator who lives in between unless he is on a railway line. Along the railways we are gradually working up a market for firewood. In most places we have much more firewood than we can sell, and we are trying to work up a market for it and gradually extending its sale. The idea is that a shopkeeper in the bazar buys a truckload of firewood from us and retails it. In that way we can help places near a railway. People away from the railway can only get firewood by having forests of their own.

20674. How do you fix the price at which you sell this firewood ?—We sell it at cost price for cutting, loading and so on, *plus* the usual royalty.

20675. Are you actually putting the firewood on to the rail ?—Yes.

20676. Where does it leave your hands ?—When it is on the truck. In the case of Siliguri, we load it on to the broad-gauge truck ourselves.

20677. You do no distribution ?—No, except that we send it up to the tea gardens. We always sell by the truckload on the rail.

20678. Have you any depôts ?—Yes. The Siliguri depôt is one. My depôt is where I load it.

20679. You have no depôts in the cultivated areas between the forests ?—No. I have no staff for that. It would, I admit, be the right way to do it, but the simplest way is to sell it to a shopkeeper and let him do that part of the work.

20680. Can you give us any idea of the rate at which the demand for fuel is growing ?—It has only started in the last few years. Five years ago it was an almost unknown thing to see firewood on a truck in Northern Bengal, and now about 50 acres a year is used, with round about 2,000 to 3,000 cubic feet to an acre. It would be very difficult to give you figures; I can only say it is certainly increasing. Of course we are developing it purely from the commercial point of view, with no philanthropic idea at all. We are simply looking for a market.

20681. Are you getting special rates from the railways ?—We are just beginning to do so. The railway rates used to be a big item. I have figures here which may be useful to you. This was when I used to send fuel by rail. Cutting and stacking come to Rs. 1-2 per hundred cubic feet. Carrying to the railway you could put down at anything from 3½ annas to 8 annas; and loading was about 2 annas. We made some profit on it over and above the royalty, because we engaged our own labour.

20682. *Mr. Gupta*: But the royalty is your profit too ?—The royalty is our profit for owning the forest and the other profit is our profit on the commercial undertaking. The royalty was at that time Rs. 2-10. I think it has gone down a bit now. We are not making very much out of it.

20683. *The Chairman*: Rs. 2-6 or something like that ?—It may be less; it may be Rs. 2 now, royalty and profit. Whether you call it royalty or profit makes no difference.

20684. And Rs. 2 covers both ?—At that time we were paying freights up to the tea gardens at Rs. 36 for the truck of 850 cubic feet. You have got to divide 36 by 8½ and that would give the real freight to where the principal market was. It was very expensive of course. We get much better rates now by the Eastern Bengal Railway.

20685. What are the rates ?—I think we have got specially reduced rates for our fuel.

20686. Do you feel that every effort has been made by your own department and the Agricultural Department to combine their interests to get the rates for fuel reduced as low as possible ?—Yes; we made every effort on our part but naturally the railways are slow to make alterations.

20687. Do you know at all how the price to the consumer compares with coal ?—I can tell you from my own district. The cost of a maund of coal is about 12 annas in a certain garden; it is getting wood fuel for something like 8 annas.

20688. The same bulk or the same calorific value ?—The same maundage; and the calorific value is roughly, as nearly as possible, half. He was actually losing by using wood instead of coal except that he is far from the railway and short of carts.

20689. But when you come down into the cultivated districts between your two great forest areas ?—Then it comes by rail, but I am afraid I cannot give you *pucca* figures now; I can give you them later.

20690. I think they are important ?—I can give you them.

20691. Have you considered the problem of preparing fuel from wood ?—Yes; just after the War, in 1919, we considered the question of burning charcoal and making briquettes. It was considered by the Buxar Timber Trading Company, since defunct. The difficulty was to get the stuff to stick together. The people who know most about it at present are the Research Institute at Dehra Dun and you are no doubt in touch with them. They will be able to give the latest information about it. The only reason why we are not doing it is that as far as we know it has not been commercially successful for us yet.

20692. But you will agree that where the railway freightage is such a very important consideration, reduction in bulk without a reduction in the calorific value is an important matter ?—Yes; in the hills we are burning a lot of charcoal because most of our firewood really goes out as charcoal for the same reason; but I thought you meant on rather a big scale.

20693. I was thinking of both ?—We can always get more charcoal burnt. The difficulty is shortage of charcoal burners.

20694. Could they not be trained ?—They probably could. But you know sometimes it is difficult to get a big enough crowd of men for training. They are all one type of men in the hills and it would be a good thing if we could train other people to do it. But labour shortage is a difficulty all round the place. We are always short of labour.

20695. You told the Commission that your department regards these matters from the commercial angle. Having regard to the immense importance to the cultivators and to agriculture in general of an adequate supply of some fuel other than cowdung, do you feel that your department, in the nature of things, can give this matter the attention and provide the impetus which its importance deserved ?—I would rather if it were taken up by somebody else ; but certainly we do as much as we can. The point is that firewood from our point of view is roughly about a fifth of the value of timber. We give about five times as much time to thinking about timber than we do to thinking about firewood. But I am all for helping any scheme like that or investigating it myself as far as I can.

20696. I take it that necessarily the greater part of your time and attention is devoted to the commercial interests of the large timber areas which are committed to your charge ?—Yes.

20697. And I presume neither you nor your superior subordinates can devote their personal attention to these matters which, from the forestry angle, are matters of minor detail ?—Yes ; of course, you cannot call firewood a matter of minor detail. It is probably a fifth as important as timber. It is engaging more and more of our attention every day. But at the same time I say if anybody else will take it up, we shall be pleased to help him.

20698. *The Raja of Parlakimedi :* Are there many villages round about your reserves ? —Yes ; naturally the land adjoining the reserve is cultivated land in most cases. You mean big villages ?

20699. Thickly populated villages ?—On the whole the forests are in the less thickly populated areas.

20700. You have reserve lines cut all round, have you not ?—Yes, unless there is a natural boundary, for instance, a stream or something else.

20701. In such thickly populated areas, do you allow a certain percentage of removal for *bona fide* use of the cultivators from the forests ?—In Chittagong we have a special rate. But ordinarily the cultivators are considered as the general public. We do not ordinarily regard a cultivator who lives next door to us any differently to what we regard a man ten miles away. In Northern Bengal, that is the case.

20702. The cultivators do not get any concession rates for removal of fuel or wood for implements from the forests ?—In Chittagong they do ; there are special rates for household purposes ; household rates and trade rates ; but in Northern Bengal the two things are the same to anybody.

20703. No difference between the two ?—No difference between the cultivator and any other man. In fact, practically all our customers are cultivators unless there are tea gardens.

20704. Do you have the system of cutting by coupes ?—Yes, it is practically all by coupes except dead wood.

20705. And do you allow the removal of dead wood in the reserves ?—Yes, we allow it at cheap rates by cart-load or by the head-load.

20706. You do not allow removal of that sort of wood free of charge ?—No, not free of charge. I am not sure, but in the Chittagong hill tract I should imagine it is free of charge : that is a jungly part.

20707. Do you set apart any portion of the reserve for *bona fide* demands of the villagers ?—No ; my reserve is supposed to be for the whole of Bengal. I do not make any distinction. All my stuff goes to the villages. My profits go up when you get a good jute year and they go down in a bad jute year and the same with paddy. My customers are practically the cultivators.

20708. What superior species do you have in your forests ?—*Sal* is the most important in Northern Bengal, *sundri* in the Sunderbans, and it is a pretty long list in Chittagong.

20709. Do you have teak also ?—We have no natural teak. We have got teak plantations in Chittagong.

20710. Are you encouraging plantations of the superior variety ?—Yes.

20711. You are taking that up ?—Yes.

20712. May I know what percentage of the superior species required by the Railway Department you are able to supply ?—We are supplying very little except *sal* to the Railway Department.

20713. That is for sleepers ?—Sleepers and construction work. The Carriage Department takes *sal* from us too. The rest is only slightly taken, mere experimental orders. They have tried a few things lately from us. We are always experimenting with things. But really the big business between us is practically confined to *sal*, with the exception of *gurjan* from Chittagong which is also bought by the Railway Department.

20714. That is for what purpose ?—Carriage construction I should imagine.

20715. Why only a small percentage ? Is it because of the scarcity of good timber, or is it because you cannot get the timber down from the forests ? You say you are able to supply only a certain percentage of the requirements of the railways ?—I did not say " a certain percentage of the requirements of the railways, " I said " only a small percentage of the trees of that species we are selling to the railways. " We are supplying the railways as much as we can in the open market. The railways are not as good customers as some other people ; sometimes we can get a bit more from the other people. But as a matter of fact the railways are large customers mostly for *sal*.

20716. Has sandalwood been tried in these parts ?—No. I think the chances of growing sandalwood would be about much the same as of growing pines in the plains of Bengal. I do not know if Western Bengal might be able to grow it.

20717. It has not been tried ?—No. If anyone suggested it to me I should certainly dissuade them. It is a wet climate. Possibly Western Bengal might be able to grow sandalwood.

20718. In the high hills you grow cinchona ?—Yes, but that has been done by the Cinchona Department.

20719. The Forest Department has nothing to do with it ?—It has nothing to do with me. I make over land to them. It is a special job ; I know less about growing cinchona than about growing paddy ; I do grow paddy sometimes, but I do not grow cinchona.

20720. With regard to grazing fees, have you different rates for different species of cattle ?—Not for different species.

20721. For cows and buffaloes ?—Yes ; they do have different rates.

20722. Do you encourage cheap grazing in your forests ?—I discourage it. Personally I discourage grazing as far as I can. It is sometimes absolutely necessary to allow grazing ; but I personally would like to see the tail of the last cow walking out of the forests.

20723. *Sir James MacKenna ;* What about the lac industry in Bengal ?—We have not done much ; we tried it experimentally once or twice. I hear they are doing fairly well in Assam, and, if I hear that it is definitely successful there, it is quite possible we might grow it.

20724. It is not a serious matter with you at present ?—No. Bihar and Orissa and Assam are the two Provinces to ask.

Sir James MacKenna : And Burma ?

20725. *Professor Gangulee* : You refer to shortage of labour ; is it periodic or chronic ? —It is chronic. The more labour I can get the better I shall be pleased.

20726. Have you thought about the idea of having a labour colony ?—We have labour colonies ; every forest village is in a sense a labour colony.

20727. Is there no surplus labour ?—I send out recruiters, and they come back with a man and a boy.

20728. What about communications in your forest areas ?—We are shouting for more money. They have improved very much in recent years.

20729. Without communications you cannot possibly develop your fodder supply or fuel supply ?—No.

20730. You have referred to the question of denudation of forest. Is it your view that denudation may be one of the chief causes of floods ?—Certainly ; I have said that in my note.

20731. In recent years there have been a number of floods in the Presidency. Do you think they were due to this denudation ?—You are referring to the big floods. I was not speaking about them ; I am speaking about the comparatively milder ones, when a river comes down in flood and there is a big wash-out. I have no experience of anything 50 miles away from the forests.

20732. The Teesta flood ; that was perhaps due to denudation ?—If the whole of the hills had been still under forest, I think the Teesta would not have been split up as it has been. In the absence of vegetation, the rains run off in torrents. The clearing of forests has a lot to do with it. If they had been warned about it, and they had carefully grown trees for twenty years, the Teesta would have been much more manageable than it is now. The more you clear the more floods you get.

20733. What quality of grass you grow ? Have you taken any survey ?—I know most of the species. We get various saccharums, *Saccharum spontaneum* grows on the river beds. In actual forests we try to grow trees, and the result is the more trees we get in, the less grass we get.

20734. Your method of stall-feeding is rather interesting. Is it getting popular amongst the cultivators in your neighbourhood ?—Well ; all the grass in the hills is now sold to the graziers in and out of the forests. I find it is becoming popular because they still continue to get more cattle into the villages. It was not popular to start with, not a bit.

20735. On what occasions do you come into contact with the Department of Agriculture ?—I grow a little jute seed for them and they come up and give me advice.

20736. Soil erosion is a serious problem. Did you discuss that matter with them ?—Mr. Finlow approached me at the same time as Mr. G. S. Dutt, and that was the reason I went to Western Bengal. The agricultural people supported me.

20737. On any other occasion, say on the question of stall-feeding ?—I do not think we have ever talked about stall-feeding.

20738. *Mr. Kamat :* Are there any bamboo areas in Bengal ?—Yes, in Chittagong.

20739. What use are you making of your bamboos ?—We are selling them as far as we can ; we are also making use of them for grazing, but that is a side line. We are selling them mostly to local people, mainly cultivators ; we are also selling quite a lot recently to the paper industry.

20740. That is exactly what I wanted. Have you considered the possibility of making papers out of your bamboos ?—In Dehra Dun they made original investigations and published the results. They put in a plant as a sort of experiment.

20741. That has been done by Mr. Raitt ?—Yes. When I get a bamboo and I want to test it, I send it direct to Dehra Dun.

20742. Do you know what opinion Mr. Raitt has given about the Bengal bamboos ?—I am afraid I cannot tell you what his opinion is. I do not know which the paper concerns like.

20743. The Titagarh people go outside the Province of Bengal for their raw material ?—The cause of that probably is bad communications.

20744. They are also making paper from grass. Is that from your Province or from outside ?—I think from outside. It is all *sabai* grass they get, and we have not got *sabai* grass. We have tried experiments with all kinds of grasses, and though I have got samples of paper prepared from them, I think their conversion will never be a commercial success.

20745. Do you know Mr. Sandall, who was appointed by the Government of India sometime ago ?—No.

20746. I think he was in Burma. Did he visit your Province ?—I never met him.

20747. It was not in your time ?—I have never heard of him.

20748. Do you know that besides *sabai* grass there are other grasses from which paper could be made ?—In fact you can make paper out of any grass. The question is whether it will be a practical proposition both from the mill point of view and the collection point of view.

20749. If that is the case, why do the Titagarh people import their grass from a place so far away as Nepal ?—Because possibly they want *sabai* grass which we do not grow. I should think that is the reason ; but I do not actually know what reason they have. If they want this *sabai* grass we cannot make it for them.

20750. It is not only *sabai* grass, but every grass ?—Are the Titagarh people making paper from every grass ?

20751. Certainly. I myself have sent some grasses to England, and they are making paper out of it ?—I have a great many samples of paper made from grasses, but I do not know the commercial possibilities which depend upon the quality of grass you can get.

20752. I know it, and I have sent grass to Sweden and other places. I do not know whether you are exploiting your grasses well ?—No. I have not done anything. If you want to try some grasses I will give you them and I will give any information I may have on them.

20753. I have got grass in my Province ?—Then, what do you want ?

20754. Capital ?—We are a quasi-Commercial Department but I have never been asked for a loan before.

20755. Are you exploiting your grass forests well ?—We are not exploiting them at all. We get some money by selling grass for thatching.

20756. *Rai Bahadur Bannerji :* You told the Commission a few minutes ago that you used to pay Rs. 36 per truck to the Eastern Bengal Railway ?—No ; to the Darjeeling-Himalayan Railway we paid Rs. 36-4. Recently the Eastern Bengal Railway have reduced their rates.

20757. Do you think a further reduction of the railway freight to carry firewood will bring it closer to the real cultivators ?—Yes, certainly.

20758. You said that the calorific value of firewood was half as much as that of coal ?—Yes.

20759. What is the calorific value of charcoal as compared to that of coal ?—It might take me a minute or two to look up, but I can let you have it later.

20760. *The Chairman :* That is the best way.

20761. *Rai Bahadur Bannerji :* Do you not think that soft coke has got more calorific value than steam coal ?—I am afraid I have not the least idea.

20762. *Sir Ganga Ram :* What is soft coke ?

20763. *Rai Bahadur Bannerji :* Soft coke is charred coal, steam coal or *kutcha* coal is burnt to red heat and all the gaseous components are driven out ?—I am afraid I am not an expert in fuels. I could tell you something about wood and also something in comparison with coal, but I am afraid I cannot give you any comparison between coal and coke.

20764. You said in the course of your examination that Western Bengal has not been investigated as to the probabilities of afforestation or disforestation ?—It has not been properly investigated yet.

20765. Do you not think it should be done in the near future ?—Yes, I have been down there twice and written a report, but the trouble is not so much a technical one. I think every one will agree as to what ought to be done ; but the point is what can be done, and if anything ever is done, it will be the result of a strenuous policy.

20766. *Sir Henry Lawrence :* You derive most of your revenue from reserved forests ?—Certainly from reserved forests.

20767. And your revenue is Rs. 25 lakhs a year ?—The net revenue this year was Rs. 15 lakhs and the gross was about 25 lakhs. We did rather better this year than last.

20768. Have you got the report ?—It is in the press ; last year, as far as I remember we cleared Rs. 10 lakhs.

20769. The expenditure is Rs. 15 lakhs, the revenue is Rs. 25 lakhs, and you clear roughly Rs. 10 lakhs ?—That was last year ; this year we have cleared 15 lakhs and the expenditure was somewhere about 12 lakhs ; that would be a gross revenue of 27 lakhs. I had better give you more exact figures which are in the annual report, which I will send you.

20770. Are you satisfied with the money you have at your disposal for the organisation and improvement of your forest areas ?—Yes, on the whole we can generally get money. We have got to consider both sides of the book rather differently from other departments. Even if we can get the money we do not always want to spend too much straight off ; on the whole, we have been very fairly well treated.

20771. In this statement here, your expenditure on communications and building is about Rs. 1½ lakhs ?—Yes.

20772. Is that sufficient for the improvement of your forests ?—That is a figure which fluctuates from year to year very much ; I cannot really tell you what that year represented exactly ; we were not doing very much, I fancy.

20773. Were you suffering from retrenchment ?—No, I do not think we have anything very much to complain of ; it is more or less in our own hands ; we are more or less consulted about how much we are going to put back into the business and how much we are going to show as profit.

20774. Do you think that the question of the preparation of charcoal and its distribution to the villages has received sufficient attention ?—I do not know about charcoal ; most of the villagers do not want charcoal, they mostly want firewood. It has had some attention, and it will get some more ; it is certainly a thing that ought to be more thoroughly investigated.

20775. I do not see it mentioned in the report of the Government on the operations of the department ?—I do not think it was mentioned ; it is really rather in the experimental stage. I do not know that we have even got down to the experimental stage ; you can quite well say that it is a subject for more attention.

20776. Would that require much more expenditure ?—No. We hope to be able to make the thing profitable straight away.

20777. You can do it within your budget ?—Yes. We have got to work the thing up ; if they are commercial success, they pay for themselves.

20778. Do you consider that any propaganda should be undertaken to educate the villager to the use of firewood ?—I think, if the *kyaks* and shopkeepers buy truck-loads, which they seem to be inclined to do, you can leave the propaganda to them. If you have a bigger propaganda now, the difficulty will be that you will not have the material to supply to them. It is vital not to advertise a thing until you can really push it on to the market ; if the supply ran short, the propaganda would all go to waste.

20779. The distributing agency is sufficiently acute and alive to its own interest ?—The *kyah* is very much alive to his own interest ; if we can make it a job for him, he will push it.

20780. I was checking up some figures and comparing your general financial results with those of Bombay with which I am more acquainted. I see that you have spent about 4 annas an acre, which is rather less, as Bombay spends about 8 annas an acre on exploitation and development ; and you get a net return of 3 annas an acre and Bombay gets 4 annas ?—Yes.

20781. With the final result that you get Rs. 10 or Rs. 15 lakhs revenue and Bombay gets Rs. 25 lakhs, Rs. 30 lakhs and Rs. 35 lakhs as revenue ?—Care must be exercised in the interpretation of acreage figures, because it depends on what the forests are like. An enormous amount of stuff that is shown as forest is actually cultivated land in the Chittagong Hill tracts. Four thousand square miles of cultivated land in the Chittagong Hill tracts is shown as Unclassed State Forest, but it is not really forest at all.

20782. Your developments in the Sunderbans, I suppose, do not take the form of making roads very much ?—No ; you do not need any roads there at all.

20783. They are covered by water ?—That is the secret of the Sunderbans cheapness.

20784. You get your revenue there very cheaply ?—Yes.

20785. Have you got efficient means of transport by water ?—We have two big steamers and three little ones that are fairly efficient. I do not think we really ought to spend more on steamers. All forest produce is extracted by country boats.

20786. *Sir James MacKenna :* Are they departmental steamers ?—Yes.

20787. *Sir Henry Lawrence :* I would like to ask you whether you do not think that by spending more money you could get a great deal more revenue ?—Yes, but, if I may be allowed to say so, let me have it gradually ; if I am landed with a large amount of money, I shall not be able to digest it, so to speak.

20788. You want to train your establishment ?—That is the great thing ; training the establishment and also exploring schemes for plantations. I could make more by spending more any time.

20789. If you had a gradual increase of your budget in five years, at the end of the 5 years you would show a substantial profit ?—Yes.

20790. *Sir Ganga Ram :* What are the commercial timbers in your forests ?—*Sal* is the most important.

20791. Are there any factories which make sleepers ?—We have a mill, but they are mostly sawn in the forest.

20792. You make sleepers ?—We make sleepers ; it is done by hand sawing, mostly in the forest.

20793. How many sleepers do you supply to the Railway Department ?—I could not tell you off-hand ; I should put it at something like 50,000 ordinaries and perhaps about an equal bulk of specials, but we do a lot of specials.

20794. Do you supply all the wants of the railways ?—No, not all their wants.

20795. Can you not supply all the requirements of the railways ?—No ; as far as *sal* is concerned, I am selling the whole of my crop, all that I have got to sell each year, the whole of my annual outturn, so that I could not increase my market for *sal*. On the other hand, sometimes I get better prices from other people than I do from the railways for *sal*.

20796. For building purposes ?—For building purposes and for all sorts of other purposes. I like the railways as a stand by, and I am determined never to let the railways down ; what I promise I will give them ; I like them as a market to fall back upon.

20797. You must see that the thing as a whole is in the interests of India ?—Yes.

20798. If you supply them with all your *sal*, they need not import from other Province ? —I find that if they use our *sal* for sleepers, they do not pay us as much as the other people, and if we supply them with all our *sal* other people will have to import the same thing at higher rates ; it will cut both ways.

20799. Do you supply them with seasoned sleepers or fresh cut sleepers ?—Fresh cut.

20800. Do they not insist upon seasoned sleepers ?—No. You cannot season *sal* practically.

20801. That is the only timber you have for railway sleepers ?—Practically ; not, however, the only one.

20802. Have you any timber for starting match factories ?—Yes, but there is rather a difficulty about it. I can supply different species of wood, but the match factories like to get one species only. I have something like 500 different species in Northern Bengal, and if they get 500 trees of different species it makes it rather hard for the engineer in charge of the match factory.

20803. Can you not supply them with one kind of tree ?—I could supply them 1 in 500.

20804. There is a match factory in Bengal ?—There are several.

20805. And they are importing their wood ?—Yes. I have had match factory men up to see me, and I have gone as far as possible in every direction ; I have offered them anything they want. The difficulty is that we have not got any forests of one species. It does not matter which it may be ; take the worst of the lot, we will say *kadamb*. If I had that, I could supply the requirements of the match factories ; the difficulty is that one is a *kadamb* tree, another something else ; there are 50 different varieties growing in the same block ; it is therefore extremely difficult to supply a man with what he wants in sufficient quantities. The secret of success of *sal* is that we have a lot of it rather than that it is the best timber.

20806. I should think that you should supply the railways with all they want ?—If they pay better prices, we will do it.

20807. Of course, they pay you the same price as they do for imported sleepers, do they not ?—If they pay me as much as I can get from other people, I will let them have my sleepers every time.

20808. You said something about the scarcity of labour. What wages do you pay to the labourers ?—The wages vary in different places. We pay the same wages as are paid by tea gardens in Northern Bengal. It amounts to about 8 or 9 annas a day. Sawyers, of course, get more.

20809. And you cannot get sufficient labour for 8 or 9 annas ?—No.

20810. How is that ? Can you explain it in any way ? There is such an immense population and then there is the cry of unemployment ?—The foot hills of Bengal are not very healthy ; in fact, they are rather unhealthy ; that is one reason.

20811. You allow grazing to the villagers ?—Yes, to our own villagers.

20812. And there are leaves also. Do not the tea planters collect them ?—We do not sell any leaf mould, not in any real quantity.

20813. What about the cattle-dung and all that sort of thing that is left behind ?—That does not amount to much. The grazing is not very heavy, so the cowdung does not make much difference.

20814. I thought that cowdung was in great demand by the tea planters ?—What the graziers ordinarily do is that they drive their cattle home in the afternoon and whatever cowdung there is they take it away for growing tobacco.

20815. Do you help the cultivators with any nurseries where they can get trees for plantation ?—If they wanted them, we could always give them. I have not done so actually because I have not yet been asked for them.

20816. Is it not a good suggestion for the improvement of the land ?—If they asked for them from us, we would certainly have given them.

20817. You might have made a suggestion of that kind ?—It certainly could be done.

20818. You have no resin industry in this Presidency ?—No, we have no such industry.

20819. Have you any other commercial industry ?—There are no commercial industries other than those that I have already mentioned.

20820. At what rate do you supply the charcoal to the contractor ? Do you have your own charcoal or do you simply give them the wood to burn charcoal ?—We sell them the wood and they burn it on the spot.

20821. Have you any idea as to what they get ? Is it one-third of the wood ?—They get about Rs. 1-8-0 per bag, supposed to weigh one maund, in the Darjeeling bazaar. If you want exact information about it you had better ask me separately about it. I would much rather get it straight from the book.

20822. You make the bulk of your income from the old forests. How much income do you make from the forests that you have planted ?—The trees that we have planted are very small yet.

20823. What have you planted ?—We have planted *sal* trees, but they are very small.

20824. Some day they will become big. What other trees have you planted ?—We have planted *gamari champ, malagiri* teak and many other varieties of trees. There is a very long list. I wish you could come round and have a look at them. They are very interesting.

20825. Are they in the Sunderbans or in Darjeeling ?—They are all over Northern Bengal and Chittagong.

20825*a* You mentioned just now that a large area was sandy waste. Was that for want of forests ?—If they had given us that area, we would have taken care of it.

20826. Whose business was it to look after this ?—It is the Civil Department presumably who are in possession of that area. In point of fact, you must have a certain amount of cultivation and cultivation naturally is in charge of the Civil Department.

20827. The cultivation was to the good of Government. Was it not ?—Yes. But we cannot start planting trees in other peoples' fields.

20828. But the area belonged to Government ?—If they give us those fields, we could certainly plant trees there. I know forest people who say that the whole of Bengal should be in charge of the Forest Department.

20829. Have you ever tried in your forest slopes to raise trees by terracing them ?—It has been done only in two land slips. That is generally done by the Public Works Department in conjunction with us. We plant the trees and they do the terracing.

20830. What do they do with the terrace ? Do not they lease it to the people for cultivation ?—Only in dangerous places they do terracing and we plant trees. But we are not allowed to cut them.

20831. In the meantime, do they not grow potatoes there ?—We put in the fastest growing trees.

20832. Potato is the best crop for it ?—I find the potatoes are the worst crop for steep slopes on the hill side.

20833. If you lease the land on very cheap terms, I think people would come forward and grow potatoes ?—They will grow potatoes all right, but they will have the whole of your hill side down before you know where you are.

20834. *Sir Thomas Middleton :* What are your sleepers worth roughly ?—We are paid Rs. 3-2-0 for meter-gauge sleepers and Rs. 8-0-0 for broad-gauge sleepers at present. We think they are worth more.

20835. Sir Henry Lawrence raised the question of the net revenue from the Bombay and Bengal forests. Are those forests comparable in this sense that in Bombay a much greater proportion of them is under grazing than in Bengal ?—I should think so. But I am afraid I really do not know anything of Bombay. I have not even been in the forests of Bombay.

Sir Henry Lawrence : The answer is in the negative.

20836. *Sir Thomas Middleton :* I think you told us that the total area under forests according to your measurements was something like 11,000 square miles ?—Yes, but I do not know if I have given the right figure.

20837. That is roughly about 7,000,000 acres. I have been comparing that area with the area which is accounted for in the Bengal statistics and the area which is accounted for there district by district is 4½ milllion acres. I wonder where the missing acres exist. Are they in the South ?—I should imagine it is the Unclassed State Forests that have been left out. They come to about 4,000 square miles. Are you sure that the statement you made is not for reserved forests only ?

20838. It is forests without any qualification ?—Strictly speaking it ought to be 11,000 square miles. Of this area 5,288 square miles is reserved. The protected area is 1,700 square miles and the rest would be Unclassed State Forests which you can practically consider as no forests at all.

20839. And the area in Northern Bengal, which is a very important area, as given in the Bengal statistics would be 650,000 acres ?—Yes. If you simply add the areas of forests in Jalpaiguri and Darjeeling civil districts, it would give you the total area. It is about 1,000 square miles.

20840. That means that there is a missing area somewhere in the south. Chittagong is abut 2,000 square miles ?—It only comes to 2,000 square miles there, because 4,000 square miles is in the Chittagong hill tracts which are shown as Unclassed State Forests.

20841. Chittagong hill tracts are given here as about 900,000 acres, which would be about 1,500 square miles ?—The whole of the Chittagong hill tracts is shown as Unclassed State Forests. It is not really forests at all and I understood that that area was supposed to be 4,000 square miles.

20842. Is it there that the missing acres exist ?—Yes. It is of no importance.

20843. Your forests in Bengal are well distributed. That is to say, you have got them in north, south and east and you are adopting the *taungya* system in all of them ?—Yes, except the Sunderbans.

20844. Have you had a good deal of experience in working the *taungya* system experimentally ?—Yes.

20845. What happens after a clear felling. How long do you leave it before you start cultivation ?—You do it as quickly as you can. Ideally, you are likely to get your trees cleared in February and burnt in March and then you should get a crop as soon after that as may be possible.

20846. Do not the roots give you trouble ?—You get rid of a certain amount of them by harrowing the land.

20847. So, in practice you do not have much trouble in getting cultivation there in the first year ?—You have very little trouble in the first year. It costs about Rs. 10 an acre if you are doing it yourself. The cultivator does not reckon on his time much and he probably does not put in as deep a hoe as we do. Then we sometimes hoe it again for levelling and that may cost us something like Rs. 2-8 or Rs. 3 per acre. Then we sow crops of various kinds; jute is very often put in. The cultivator generally puts in paddy and cotton.

20848. Jute would be in the Khulna area ?—It is in the north of Bengal. We grow it for seed purposes.

20849. Is there any trouble in the second year ?—You can get a crop in the second year too. The best cultivators like to get a second crop. You have practically no trouble in the second year. They generally put in mustard in the cold weather. In the second year they put in another crop. Then during the second rains you get nothing but grass and that gives us no trouble. This grass is called *bansara*. We get these two years' cultivation and then you can be quite sure you are going to have a good show; when the cultivator has finished with it we generally sow *tophrosia*.

20850. That is a leguminous plant ?—Yes.

20851. When the cultivator has finished with it, what is your first process ?—We have to put in our things, in the first year ; we have got our plants in with the first year's crop.

20852. You plant ?—We plant or sow, depending on the species. In the case of *sal* we put them in in long rows, six feet apart, and the crop is grown in the middle. It is not a crop you can plough ; it is all done with a hoe ; so it does not get in the way of the crops.

20853. Can you tell me whether this system of cultivation has been adopted anywhere else except in Burma ?—They have tried it in the Central Provinces and Bihar and Orissa, and I think in certain places in Madras. I should be surprised if they have not small areas in almost every province.

20854. From the forestry point of view you regard it as a very desirable practice ?—Yes.

20855. Have you any purely coniferous forests in the northern area?—We have little patches in rather inaccessible places from 10,000 to 12,000 feet up.

20856. Then this practice is for broad leaves trees ?—Yes. We have introduced coniferous species *Cryptomeria Japonica* between 5,000 and 7,000 feet.

20857. Is that a timber tree with you ?—Yes ; it makes boxes, planking, ceilings and things like that very well.

20858. Coming to the village forests, you have heard of the practice in Madras and you think it is one that ought to be encouraged ?—I do not pretend to know much about it, but if it is as I have heard represented by a Madras forest man it sounds an excellent idea. I do not pretend to know anything about it first-hand at all.

20859. Assuming you thought well of the idea and wanted to introduce it in Bengal, would you be prepared to lend a forest officer to advise these villagers who are making village forests ?—What I have done so far is to go down myself and advise the Collector, and he has carried on. I would rather do it myself than lend any one else. I can go along and do it in a week or so.

20860. Would they not want some one on the spot for a year or two to start with ?—It is a fairly simple thing from a technical point of view. The difficult thing is to get the people to do it. It is all a matter of advising ; you cannot order anyone to do anything. I think their own people, the Civil officers, are the people to do it. There was one man at Bankura who was very keen and who got the thing going ; I simply told him what should be done.

20861. If you found keen men in other districts you would be prepared to do all you could ?—Certainly.

20862. From your knowledge of Bengal, do you think there would be any trouble in suggesting suitable species for any area ?—I know exactly what to suggest for Northern and Eastern Bengal. I have made suggestions for Western Bengal, but I should like to see how they work out before giving a final opinion.

20863. Are you aiming at a very short rotation ?—Yes.

20864. Fifteen years ?—It will have to be even shorter than that to start with. My advice in these very much cut-about forests is to divide the little patch of forest into two and try to protect one half, leaving the other half for two years, and then divide it into four and take one of the parts that has had two years to get up a little, and work in that quarter ; after which you might have a four-year rotation for some time. That seems to be the only possible way to do it without having a riot or trouble of some kind.

20865. You would gradually lengthen your rotation as you accumulated material locally so as to work up to ten and fifteen years ?—Certainly, work up to that and possibly longer eventually.

20866. *Dr. Hyder :* Is the whole of this *taungya* system of cultivation under your control or do the forest ryots trick you sometimes in Chittagong and other hill tracts? Is this *taungya* system of cultivation departmental or aboriginal ?—Departmental.

20867. You do not have any forest tribes as they have in Burma ?—No. In Chittagong there are people who are doing it now, but without planting up of course. This is the practice of *jhuming* as we call it here. There are *jhumiers* in many parts, and in Chittagong they sometimes come and do the *taungya* system of *jhuming* in the forest for us, but in Northern Bengal most of the people who do the *taungya* system for us are people who

gave up *jhuming* sometime ago and who had more or less settled down to fixed cultivation, but who go back to the old practice if given the opportunity.

20868. Would you grow *sal* or *gamari* in a cleared area ?—It depends on the land. If the land will grow *sal* I should grow *sal*.

20869. *Sal* would give you in 80 years about Rs. 5,000 ?—About 6,000 cubic feet in 80 years, while *gamari* will give you 6,000 cubic feet in 40 years. On the other hand, we get something like Rs. 2 a cubic foot in the round for the *sal*, and something like 9 annas a cubic foot for the other. It is a financial problem which has to be worked out, and must be based on the price the timber is going to fetch in 40 years time.

20870. And the suitability of the soil ?—That is the chief point; that is why we sometimes put in *gamari*. I do not put in *gamari* anywhere where I can grow *sal*.

20871. Do you know what the price of *chaulmugra* seed is ?—Last time I let a man collect all he could for Rs. 200, and he failed to get it. I have no doubt it is worth a lot, but it has not been a commercial success so far. I have simply let a man see what he could do for one year at a nominal figure. He failed two years running, and then he got a boat-load of it and the boat sank!

20872. *Mr. Gupta:* In visiting Bankura and looking into the possibility of having village forests there, were you acting under the orders of Government ?—No, not exactly. I was asked both by the Civil and the Agricultural Departments if I would mind doing it, and I was rather keen on doing it and went and did it more or less on my own.

20873. Did you make any report or scheme ?—I wrote a report and tried to make out a sort of scheme.

20874. But you do not know what has happened to it ?—No, not at the moment. I want to go back and see about April next.

20875. It is very important to have a workable scheme for village forests in Bengal, and Bankura is probably one of the districts which offers the best possibilities in that direction. It has been proposed that Government should acquire the land, and we are getting it very cheaply, so I am surprised you did not get orders from Government ?—I had no Government orders at all. However, the Accountant General has not objected to my travelling allowance bill, so I suppose my visit was official to that extent.

20876. But you did submit a report of some kind ?—Yes. The Collector will have a copy, and Mr. Dutt and Mr. Finlow.

20877. You said that in fixing the price of firewood you had in view both the royalty and a certain profit. As Conservator of Forests, would you have any objection if the Commission recommended that either the royalty or the profit should be left out, so that the firewood might be sold more cheaply and the use of cowdung for fuel diminished ?—As long as I do not make a loss, I should not object. I would rather sell it than give it. If I simply get the royalty and not the profit, I think that would be all right. Someone, however, is going to make that profit, and I would rather I made it than the railway.

20878. I wanted the consumer to make the profit by getting cheaper firewood ?—We should always aim at that ourselves from a commercial point of view, to encourage the thing to start with.

20879. With regard to grazing, naturally you do not like to see it encouraged, but of course the present law allows a certain amount of grazing ?—Yes, we have to, because it would be a great hardship if it were suddenly curtailed.

20880. I was going to suggest that. I suppose your subordinates look on it in the same light; they do not put unnecessary obstacles in the way ?—They are very much left to themselves in the interior. It requires my orders for a block to be opened or closed.

20881. But when it is opened I hope they have strict orders not to interfere ?—The cattle go in all right once it is opened.

20882. Have you any trees in your forests of which you could cut the twigs and leaves and stack them as fodder. For instance, in Kashmir they do that with mulberry and walnut trees ?—There are many trees that can be lopped for fodder, but we only allow it in the hills and with a few species.

20883. What kind of trees will not be harmed by it ?—It will always harm the tree, but we generally allot trees it does not much matter about. There is no species which is encouraged by being lopped.

20884. I was told it did not matter with mulberry and walnut trees, and that even if they were lopped very close they would grow up just the same again next year, or even be better ?—They will grow up again as fodder all right, but they will not be such good mulberry trees.

20885. I wanted to suggest that experiments might be made with certain trees to try to preserve their leaves and twigs for fodder ? The question of how far forests can help grazing has not been raised specially by anyone, but it is very important, I think. It is very important from the agricultural point of view ?—If I threw all my forests open to grazing now it would have practically no effect on the problem at all, because they will not go into the good parts of the forest. I have tried the effect of offering them grazing there at low rates, but they will not look at it. In Northern Bengal they wanted to go to a river-bed where of course I could not allow it ; but even if all the river-beds were open to grazing it would only affect the villagers living within a radius of 2 or 3 miles, so the whole problem of grazing in Bengal is not to be settled in that way.

20886. Your forests are in certain areas, and it would only affect the villagers round about ?—And those villagers have already considerably more outside grazing than the people living in the middle of Bengal.

20887. But cattle are moved great distances in Bengal and if good grazing were to be had might move their cattle to the forest areas ?—Yes, but we have not good grazing to offer.

20888. So from that point of view even this is not so important as you probably think. About these industrial trees, I say that because in going to different firms I have often heard them say that they do not get as much encouragement as they expect from the Forest Department and you have given the reasons that because these members are prejudiced and because you want to grow a particular tree they would not like it. Would it be worth while then to try and grow trees of that particular kind ?—That is exactly what we are doing ; I have been telling you about that.

20889. With regard to this question of extension of forests, I hope you are quite satisfied with it ; for instance, in the Sunderbans, you do not want any more forests than you have got now ?—The department wants less now apparently. The new scheme is going to take it away.

20890. That is a point I wished to ask you about, and that is why I asked you to meet me and the Collector the other day but you could not come that day. Of course we have taken into consideration the needs of the cultivators also and you also find that the profit to Government from cultivation and from the Forest Department is so discrepant ; and you have no particular complaint from that point of view ?—No. I think Government have to consider each time ; you cannot take up the whole as forest nor can you put the whole of the Sunderbans under cultivation, I should think.

20891. *Professor Gangulee :* Could you tell us if tea cultivation in Darjeeling is increasing or likely to expand extension?—Yes ; when I say Darjeeling I mean Northern Bengal. In the Darjeeling district there is very little tea except in the Terai.

20892. And for the purpose of expanding tea cultivation, you have to denude certain forest areas ?—We had never had to give up forests for tea recently ; I think the last was about 25 years ago.

20893. Do you pay visits occasionally to Dehra Dun ?—I have been there twice. I should like to go often, but it takes a long time you know.

20894. And when you pay visits there do you discuss forest problems ?—Yes ; I went there first on a Silviculture Board ; that was long ago. Then I went with the Board of Forestry one or two years ago.

20895. *Sir Ganga Ram :* Do you grow mulberry in your forests ?—One species of mulberry, yes.

20896. Is that good for sericulture ?—No ; I think it is no good.

20897. Do you grow walnut ?—Yes.

20898. Up to what size ?—About 5 to 7 feet.

20899. That is a thing which ought to be encouraged. The zamindars ought to be encouraged to grow it ?—It grows in the hills. There are no zamindars up there.

20900. No cultivators ?—There are cultivators who grow it ; you sometimes find them up to Sikkim. But they prefer to grow fruit of a more edible kind.

20901. They would certainly grow it if you supplied them with nurseries ?—I am rather hard put to it to get enough seed at present. I put out all I can get ; I am rather short of seed.

20902. Have you any professional shepherds in this Presidency ?—Yes, in Sikkim.

20903. Not actually in Bengal ?—They have professional graziers for grazing cattle

20904. Not sheep ?—Not sheep. Professional shepherds are all in Sikkim and they are all at a high elevation, round about 12,000.

20905. And they come down in the cold weather to your low forests ?—No ; they do not come into the forests.

20906. *Professor Gangulee :* What about goat-keepers ?—I do not encourage them ; but as a matter of fact I have no serious objection. I do not like goats. I think they are the most infernal things to get into the forests.

20907. *Sir Ganga Ram :* Have you any *khuds* or rivers with falls in your forest, and do you make any use of the gravitation levels ?—I have got lots of rivers. You mean for water power ?

20908. Yes ?—I am afraid the trouble about most of them is, you get lots of water in the rains but not much in the cold weather ; they go dry.

20909. In cold weather you have no *khuds* which bring water ?—The *khuds* are there but the streams dry up, a good many of them.

20910. They fall from springs on the top ?—Yes, but they dwindle down ; there is not enough of them. Water power engineers have investigated the matter.

20911. Do you have any coffee plantations in your area ?—No ; coffee was tried in the Darjeeling district about 1900. It was not a success then and all the coffee plantations went out into tea later.

20912. Have you considered the question of interculture between your young saplings ?—Yes ; that is what the '*taungya*' system means.

20913. What crops have you grown ?—I grow jute, paddy and cotton.

20914. Paddy ?—Dry weather paddy, *bhadoi* paddy.

20915. Is there a paddy like that ?—Dry paddy ; it is a very good paddy.

Rai Bahadur Bannerji : It is harvested in the month of *Bhadra*.

20916. *Sir Ganga Ram :* I want you to encourage potatoes. They are grown on our side ?—I like potatoes myself ; but my predecessor put an order down to the effect that 'whatever happened do not allow potatoes', because he found the land slipping wherever they have been growing them.

20917. Do you grow aloes ?—No, not commercially. You mean for fibre ?

20918. Yes ?—No.

20919. Is there no demand for it ?—It has been tried experimentally.

20920. Commercially ?—Apparently it was not a commercial success. I do not of course try a great many experiments myself because I have got other things to do.

(The witness withdrew.)

Rai Dr. G. C. CHATTERJEE Bahadur, Secretary, The Central Co-operative Anti-Malaria Society, Ltd., Calcutta

Replies to the Questionnaire

QUESTION 8.—IRRIGATION.—(*b*) Irrigation canals—defects in. In this country, we very often see the benefit which the irrigation canal confers on the cultivators by bringing water to their crops is nullified by these canals being the cause of intense malaria in the region. As these very cultivators are the sufferers, they cannot get the full benefit of their labour. This kind of malaria which is designated by malariologists, as " man made malaria " is not at all due to the canal itself, but is entirely due to gross negligence on the part of the authorities, in not keeping (*a*) the bunds in proper repair, thereby allowing water to percolate through the bunds, which becoming stagnant all along the canal, contribute to the breeding of mosquitoes, and (*b*) in not properly closing during the dry season the lock gates or there being some defects in the gates, allowing water continuously to leak. This water getting up into dried up bed of the canals, serves as admirable breeding grounds for anopheles—whole of the Ganges Canal, for example, originating near Hardwar in the construction of which the Irrigation Department takes justifiable pride, is however, the source of intense misery to the people living near its neighbourhood, and this is caused entirely through a negligence which can be rectified without the least expense—all that is necessary is to get the *bunds* water-tight by timely repair, and the lock gates made properly water-tight.

This stupid ignorance of elementary sanitary rules on the part of otherwise expert engineers is causing misery not only to the people, but to the very staff of the Irrigation Department as in the case of Panchkura Irrigation Canal in Midnapore, when three sets of irrigation officers have to go away on leave on account of malaria.

QUESTION 14.—IMPLEMENTS.—(*a*), (*b*) and (*c*).—From my limited knowledge in this line, I have come to know that great improvements in agriculture are possible by use of agricultural implements and that the agriculturists of this country will take to the use of implements, if they be shown that they will be benefited by using them. But unfortunately this information in proper assimilable form is not available nor is it possible for any one to give the information to the right party and in the right way, unless it be through an organisation which will not exploit the agriculturists. For this reason, it is desirable to form a Central Co-operative agency like that of the Co-operative Milk Union or the Central Society of the co-operative anti-malaria and public health movement. Government agency will not be able to do this work, as they not being able to come in touch with the people, their opinion will not carry weight nor will their information be based and corrected from local information. This Central Co-operative Agricultural Implement Supply Company will have for its shareholders the unit agricultural societies in the rural areas, who will take on loan or buy the implements from their own Central Society. An organisation on this line is in the process of formation. The only difficulty is that we do not get sufficient amount of help in advice and assistance from the Co-operative Department, as we learn that the department is undermanned.

QUESTION 22.—CO-OPERATION.—(*b*) (*iv*) Societies for the digging of wells. The co-operative public health societies with their central organisation are admirably suited for helping rural areas, digging wells or boring bore wells both for agricultural and pure water-supply. The work which has already been done in this connection by this society will be in illustration of the point. All the rural areas in the Province are included in one type or other of local body. The information about the facilities which Central Government or the bigger local bodies (District Boards) offer to the rural areas for water-supply do not as a rule reach them. Even if information is available, they have not got means to utilise it they not being able to raise sufficient amount of money to satisfy the minimum condition laid down in the above schemes. For this reason, we see the curious phenomenon, while large sums sanctioned by Government for water-supply are not utilised and got lapsed year after year, whereas rural areas are suffering from want of drinking water-supply. The Central Society has been able to remove this difficulty to a great extent, by adopting the following policy. Each registered co-operative society affiliated to the Central Society can get a loan carrying no interest, from the the Central Society, by the aid of which they are able to take advantage of the Government Scheme. In a few cases, the rural societies have taken lease or purchased insanitary tanks and excavated them by the help of these loans and have stocked them with fish and have been able to make this concern remunerative. This the Central Society is doing with its own funds. But as the sum available for the purpose is not great,

it applied to Government for a loan of two lakhs, without any interest, to be given over to the rural societies for this purpose. For this the Central Society has offered securities. Two years have passed, we have not received any reply as yet.

(*b*) (*ix*) The Central Co-operative Anti-malaria Society, Ltd., is an instance to the point. This has been formed with the express purpose of controlling preventible diseases like malaria, *kala-azar* and cholera by co-operative efforts of the people. As these societies have been able to do to a great extent what they profess, commensurate with the money and the labour available for the purpose, as is evidenced by the popularity of the movement, about 1,000 societies having been formed by only last three years' efforts of its promoters, it is desirable to push this organisation as much as possible. As these organisations have besides been able to solve the water-supply problem of the rural areas wherever it has been tried and as they have been able to infuse a high moral tone to the local bodies, want of which is the main cause of failure of the Local Self-Government in this country, it is all the more necessary to help this movement in every possible way. The way by which this movement can be spread, is by helping the Central Society, in employing a large number of organisers and the Co-operative Department paying the travelling allowance of honorary organisers and giving other facilities.

(*c*) Yes.

QUESTION 25.—WELFARE OF RURAL POPULATION.—(*a*) The only suggestion I like to make in connection with the improvement of hygiene in rural area and for promoting the general well-being and prosperity of the rural population is that these are intimately connected in this province with the prevention of malaria and *kala-azar*. Village after village is being literally wiped out by their ravages, even in places where abundant harvest is possible, due to the land being extremely fertile and all the facilities for growing paddy being available.

No agricultural improvement, however helped, is possible, so long the people who are to carry on the work, are made non-existent through the ravages of malaria. Money spent in this direction will be repaid a thousandfold. A little reflection of what has taken place in this line in Panama Canal region will convince anyone of the utility of launching or helping all anti-malaria measures which indirectly is capable of giving any amount of wealth by saving the people who are the producers of wealth. This tract of country whereby cutting a canal joining the two oceans is capable of giving any amount of wealth to the promoters, could not be done at first because of malaria and yellow fevers. As soon as the promoters, not being swayed by sophistry of false economist experts (that disease is caused by want of nutrition and this is due to want of money whereas reverse is often the case), gave supreme importance to prevention of malaria, the problem of excavation became an easy task, so this policy has been productive of greatest amount of wealth.

In this country, this sophistry is paralysing action. Besides, prevention of malaria and *kala-azar* is possible in this country with expenditure of very little money—the people themselves as soon as they get rid of this scourge will themselves finance any anti-malaria and anti-*kala-azar* scheme, with the money got out of their improved agricultural operations. Of these we can cite any number of instances.

In Basirhat sub-division, for example, an extensive tract of land around Birballi *beel*, being extremely fertile, is productive of greatest amount of wealth to the people around it. They were recently nearly depopulated by a virulent epidemic of *kala-azar*. All agricultural operations were stopped for the time being. Very recently due to the creation of several co-operative public health societies maintained by them in the area, health has returned and the tract is now as prosperous as possible. All that is necessary to do in this connection is giving the people the proper lead. In this connection, it is necessary to state that this lead which the local bodies are expected to give is not being given in the way they should give. This is due to defective franchise, the result of this is that the real people are being trodden down by some of their own countrymen, who get at the helm of affairs of the local bodies but who could not have been there, if the people had real power to elect their own representative. In this way, all the available money is being wasted in doing things which ought not to be done. Formerly, in the interior of rural areas, this all-important lead used to be given by some one among themselves, who were able to give it on account of their comparatively superior intelligence and are, so to say, born leaders, who become so, not by any election process, but by natural process. The Government has changed this order of things, by giving a representative institution in its place. But if this representative institution had been given in its entirety, these natural leaders would have come to the forefront, but as it has been given in a mutilated form, hedging in with restriction (*e.g.* by nomination, by which the

executive officers get power to interfere) is doing immense amount of harm. If a cart is to be replaced by a motor lorry, let it be done in its entirety--keeping back the lightening set or the brake or horn or the rubber tyres will not do. The solution of malaria rests not so much on huge expenditure, but on giving real franchise, by creating, for example a centralised Local Self-Government Board, consisting of best engineers, bacteriologists and sanitary experts who are to remain in touch with and guide perfectly autonomous local bodies. Any laches on the part of the local bodies are to be dealt with by this Local Self-Government Board, which is expected to possess the necessary knowledge to make out where lies the fault of the local body and not by the executive officers who have got very little knowledge of sanitation and who are swayed more by questions of prestige than well-being of the people.

Oral Evidence

20921. *The Chairman :* Dr. Chatterjee, you are good enough to come here this morning to give the Commission some information from the fund of experience that you have accumulated in urging various schemes of village and sanitary improvements and you have put in a series of notes which have been before the Commission and for which we are indebted to you. Would you like to make any statement in amplification of these notes now ?—All my idea is that there is a local patriotism which we are tapping. The system of Local Self-Government of England, if applied here, will not suffice to deal with the problem. If we start from the bottom, namely, the village societies which correspond to the village community of the olden days, the problem will be easily solved.

20922. Should I be right if I say that local patriotism comes to a focus in a village community ?—Yes ; the village community wants to do their part but they are hindered by various obstacles which are beyond their control, for example, bunds of irrigation canals and railway lines. For the removal of these they very often have to go to the District Magistrate who often refers them to various departments concerned. So they do not get any remedy. So a sort of a Village Improvement Board which will include all the heads of departments concerned with land which will give speedy remedy to the villagers is required.

20923. I hoped to examine you either in conjunction with or after Dr. Bentley because I think it would have been easier then to see how your own organisation and your own ideas fit in with the Public Health organisations. But as that cannot be I should like to ask you at once whether you feel that the Public Health Department are doing all that they can do to further the interest that you have so much at heart ?—If the medical portion of the Government Public Health Department were absolutely independent then they certainly would have done something. But they are not independent. They are ruled by civilians who have got no knowledge of sanitation. The difficulty is there. If they were free they knowing where the shoe pinches would have helped us.

20924. You find the medical officers themselves so far as they are concerned very ready to give every assistance, is that the position ?—Yes.

20925. Will you tell me something about the inception of this scheme ? When did you take interest in it ?—Practically in 1917 in my own village but I should say 1914 for it was then that the idea struck me and my association with the Municipality started. I knew a little about sanitary matters as I was in the bacteriological laboratory. I wanted to try and get the Municipality to take in the matter of sanitation. A large part of insanitation was due to the people themselves. I found if the municipality took action against the people, they became unpopular and the members who were responsible for such action were not returned at the next election. Unless the people are educated in sanitary matters it was impossible to get them to elect people taking interest in sanitary matters. I thought of getting the villagers themselves to form co-operative societies for the improvement of the sanitation. My idea was that if they found their work after all paying and economical, the local body would be induced to carry on the work more easily. The co-operative society and the local body would then merge themselves into one and the moral tone would be heightened. My idea was to work from the bottom upwards.

20926. Take the case of the anti-malarial societies. Do you think the readiness with which the villagers adopt your recommendation is due to their confidence in you or some other individuals or due to a real understanding of and belief in scientific facts ?—It is due to actual belief in scientific facts. They find that scientific truths are being realised. There is no question of personality. In my own village many persons used to die of cholera but after the introduction of pure drinking water and other preventive measures like the use of disinfectants they found that cholera vanished. Thus they came to realise that disease was due to their own making and could be prevented by them.

20927. You find that the fatalistic outlook on life came to disappear in those places ?—That is my view.

20928. Are you in touch with the Co-operative Department at all ?—Our societies are registered under the Co-operative Societies Act. But we are not subordinate to the department. We have to obey the bye-laws under the Act. And we have to send our bye-laws for confirmation to the Registrar. For these matters we have to come into contact with them.

20929. Are all your societies registered ?—About 1,000 have been formed, 300 have been registered. Gradually all will be registered.

20930. Have your co-operative health societies any capital ?—Yes, gradually they get capital.

20931. Share capital ?—We insist on their having share capital. When they start they have a small capital and when they develop, this capital increases and they utilise it in remunerative business forming part of the health work.

20932. That is the framework upon which your organisation is being built ?—Yes.

20933. You told us that you first thought of these matters in 1914 and the true inception began in 1917 ?—Yes.

20934. Now we are in 1926, how old is the oldest living society and is it living ?—Oldest societies are still in nice working condition. I should say they are the most developed societies I have ever seen. The oldest society formed in 1917 is the Panihati society. They have developed gradually and they are now taking on their shoulders the responsibility of the bigger problems like public water-supply and prevention of all the infectious diseases besides malaria. If they get more money in their hands they will form Home Crofters' Association for agricultural purposes.

20935. In your note you mention the fact that the society subsidises medical officers in some cases ?—Yes.

20936. Is that medical officer as a rule the medical officer receiving Government subsidy ?—That has got nothing to do with Government.

20937. I know your subsidy has nothing to do with Government. But I want to know whether the medical officer who receives a subsidy is sometimes or always an officer who is receiving a subsidy in order to persuade him to live in rural areas ?—Excepting Jessore I do not know whether there is any Government scheme for subsidising medical practitioners to live in rural areas. In our case, the Government are indirectly helping us through the local bodies for paying the subsidies to the medical officers of societies.

20938. What proportion of the subsidy are Government paying to the local authorities ?—That varies very much. There is no definite scheme. But Government money comes in for anti-*kala-azar* work and also for direct payment to the registered societies through the local bodies. The societies pay their medical officers from this sum.

20939. *Professor Gangulee :* What is the amount of subsidy ?—All registered graduates of the medical college get Rs. 50 a month and all those who pass out of the medical schools get Rs. 30 a month.

20940. Altogether ?—Yes.

20941. From all sources ?—Yes.

20942. *Rai Bahadur Bannerji :* From your society ?—We do not always subsidise. We are more or less a propaganda society. We see that they are paid somehow or other. We do not always pay.

20943. *The Chairman :* Do the villagers pay ?—The village society forms as it were a part and parcel of the local body. There is a rule in the local body that they will pay to the society an amount equal to the amount the society raises. From this sum they are able to subsidise their medical officers.

20944. I rather gather from you that the practice is uneven between village and village. In some cases a local authority may contribute, in others they may not contribute ?—That is quite right.

20945. And the amount which the villages have to find depends upon how much other people are prepared to put down ?—That is true.

20946. So much for the village societies. Do I understand your societies are grouped according to the objects of the central organisation ? You say you are the Central Co-operative Anti-Malaria Society, Ld. What are the constituent bodies of the Central Co-operative Anti-Malaria Society ?—We have got 200 members who pay Rs. 6 a year. The members of the Board of Directors have to pay Rs. 125 to become members.

20947. These are all members on their own behalf as individuals ?—Yes.

20948. What about the representation of the primary societies ?—One-third of the Board of Directors must be from the rural societies. They have not got to pay anything.

20949. Is there any intermediary organisation between the Central Co-operative Anti-Malaria Society and the Village Anti-Malaria Society ?—We try to get them formed but did not succeed.

20950. Are these village anti-malaria societies in touch with the central organisation ?—We are trying to get them in touch with us. But in many cases we could not. We are in touch with those societies which are situated in the districts near where they are located.

20951. Would it be correct to say that organisation would conform to the average type of co-operative societies throughout the countries ?—They are going to be more and more public health societies getting in touch with the local bodies and not with the Co-operative Department.

20952. You do not think that they are coming more in touch with the Co-operative Department as it is organised ?—We are gradually drifting away from them. The money comes from the Government through the local bodies. Therefore the idea is to get the societies more in touch with the local bodies than with the Co-operative Department.

20953. What local authorities do they deal with ?—District Boards, Union Boards, Municipalities. They are gradually becoming conterminous with the local bodies. They are keeping their individuality but their men as a rule get elected as members of the local bodies and thereby influence their policy.

20954. Do you find as a result of this movement towards closer affiliation with the local authority any tendency for the co-operative spirit as such to decline ?—I do not.

20955. I wonder whether you know what I mean by "co-operative spirit." That is spirit of self-help and of mutual responsibility, man for man in the common interest. Do you find that the spirit is inclined to wane or that the local authority comes in and assumes an important place in the organisation ?—That is what is hindering our progress. We do not know how to get rid of that. Somehow or other we suffer from it. If the co-operative spirit have been encouraged by the local authorities, it would have been plain sailing with us and we would have wiped off malaria in no time. But the local authorities assume an authority which damps the co-operative spirit in the societies, that is what is hindering our work.

20956. Do you not think the more your co-operators learn to depend upon the funds and officers of the local authorities the less those co-operators will be prepared to help themselves ?—Certainly but here is a question of authority and not so much of funds.

20957. It is a question of leaving Government to do things which people might do themselves. Is it not ?—Public health work cannot be done entirely by co-operation. There are men who will not obey and who come in the way. For these a little power is required. There is for example the question of acquisition of land for making a drain. The co-operative societies have not got this power and for this they must look to the local bodies.

20958. Do you not think that watchful competition between the truly co-operative organisation on the one hand and the normal machinery of the Government on the other is very helpful ?—I will relate one instance that will explain the point. In my own Municipality there are seven wards and there are seven anti-malaria societies. The ordinary procedure at the time of election is that two-thirds of the members are elected by the people and one-third by the Government. The two-thirds elected by the people were men who have got an idea of public health. But the members nominated by Government were then opposed to the improvement of public health. So I asked the Government why they should not nominate persons who have some public health spirit. That nomination is hindering the whole thing.

20959. Are you sure in your mind that you welcome the tendency of co-operative health societies to conform more and more to the organisation of the local body ?—Yes.

20960. Do you welcome that ? Do you think it is a good thing ?—I think so.

20961. You would not rather see your organisation veer towards the co-operative organisation ?—I would not because it is not possible. A co-operative society cannot carry on public health work independently of the local bodies. It is an impossible task.

20962. They might work in sympathetic touch with the local authority but they might look for leadership and finance to the co-operative movement, might they not ?—I have not looked from that point of view and I have not thought over the matter in that light. My idea is to gradually raise the moral tone of the local bodies through public health societies. I do not know whether any development of our movement can take place by working with the co-operative societies. My idea is to make the people carry on real public health work and not make a fetish of co-operative principle. You know of the story of the lady who went for a ride on a tiger and came back inside the tiger ?

Professor Gangulee : That is what has happened.

20963. *The Chairman :* So much for the anti-malaria organisation. Now do you have another and different central organisation for other societies ?—No.

20964. Just one central society ?—Only one. We tried to form a central society for each district. For this bye-laws have been framed. But the public spirit is not so much developed in this country that we can have a central organisation for each district. So we are more or less handicapped. One central organisation by itself can not do the work for whole of Bengal.

20965. *Professor Gangulee :* Have you any central organisation for *kala-azar* ?—Our central society works for *kala-azar* as well.

20966. *The Chairman :* Some of your societies concern themselves with water-supplies ? How many of them exist now ?—950 out of which 700 are working and the rest are not.

20967. Have you noticed any sign of a decline of interest on the part of villagers in any of these societies ?—I must say there is such a tendency. But if we can encourage them by visiting them even once a year then their interest in the societies can be kept up. But our resources do not permit of sending an organiser even once a year. Want of personal contact is the difficulty. It is not so much that the movement is dying out.

20968. It looks as though the element of personal leadership is of the utmost importance in the earlier stages of the society ?—I do not believe in it. We must show them that they have derived so much benefit from their societies. Then they will agree to carry their work. We must show them by actual statistics to what extent malaria has diminished. For that purpose we must have sufficient number of organisers and workers to go round the villagers but we have not sufficient funds for it.

20969. At what rate, if at all, is your movement growing at this moment ?—Last year when the annual report was published there were 352 societies. At the present time there are 950, in the year previous to that there were 89, in the previous 31 and in the year previous to that only 3. From 3 within the last three or four years they have gone to 950.

20970. Have you written off any societies that have failed ?—We do not like to do so. Because there is no financial responsibility in these societies. We send every month our vernacular journal dealing with public health problems to all societies whether dead or alive. For this purpose we have to keep their names in the register. For we find sometimes that an apparently dead society after a little watering sprouts out and becomes a healthy plant later on.

20971. Can you say how many are in the dormant state and how many live ones you have got ?—About 700 living ones and about 250 dying or dead.

20972. *Professor Gangulee :* Are they quite alive ?—We cannot pay personal visits to all of them. But judging from the information got from their reports we can say they are alive.

20973. *The Chairman :* Have you any societies in which you are interested which conform more to the co-operative type ?—Yes, many. Some have started co-operative dispensaries and are making profit out of them, and some have started co-operative agricultural farms as well.

20974. They conform to the co-operative type and principle ?—Yes.

20975. Do they show much vigour ?—They are as much vigorous as possible. We have not have even to go there to encourage them. They are carrying on their work independently of us, and they are self-contained.

20976. Does not that carry conviction ?—Yes.

20977. Have any of your societies, or has your central body considered the problem of nutrition at all ?—We are thinking of it just now. At the present moment we are organising a society called Home Crofters' Association for cultivating fallow lands in which plants for their foods will be grown.

20978. Is it a question of diet ?—Yes.

20979. Have you touched at all the matter of child diet ?—No. We have not.

20980. I wonder how far your organisation has proceeded in that direction ?—We have not done that.

20981. I believe curry and rice is regarded as quite a good diet for a small child in most of the villages ?—It may be. But we cannot touch that for it is a matter of habit and custom.

20982. I thought you were out to improve their habit and custom ?—Not as yet.

20983. Is that not you are doing ?—That will put too much strain on their intelligence at the present moment. They will not listen to us.

20984. *Sir Henry Lawrence*. In this report you speak of the difficulties which you have experienced. These difficulties arise not only from local bodies but also from Government departments ?—Yes, that is true.

20985. You do not receive from Government the support that you are entitled to ?—That is my idea, not the Public Health Department. I am leaving that aside, because they have done what they could under the circumstances.

20986. Do you get any help from the Co-operative Department ?—I should say we ought to get some help from them. In the case of Co-operative Credit Societies they pay the travelling expenses of honorary organisers. But in our case we are left to ourselves. We are told we are independent.

20987. Travelling allowances are paid to honorary organisers in the co-operative movement ?—Yes ; but we are not paid at all.

20988. Why is the distinction made ?—I do not know.

20989. You have made representation to Government on this matter, I suppose ?—We have done so. We have asked for paid organisers and travelling for honorary organisers. But somehow or other they make a distinction, the Co-operative Department is Government while we are not. There was a Conference in the Government House presided over by Lord Lytton and attended by the Secretary, Local Self-Government, and Member of the Executive Council. At the Conference a clear cut distinction was made between the District Boards and Municipalities which they said were Government and our society which we were told was not Government. We could not understand what their idea was.

20990. You have discussed the question with the Registrar ?—Yes.

20991. You cannot understand each other's point of view ?—We do not understand what they meant. They said " You have a Board of Directors and you have raised money for help to the societies. We will not interfere in your matters. You are autonomous." And this autonomy means that we are left out without being cared for at all.

20992. Are many of your societies registered ?—300 out of 950.

20993. Have you applied for the others to be registered ?—About eight months ago there were 300 societies, to-day there are 950. Last year there were 100 societies registered. As they are gradually forming and developing they are being registered.

20994. You have no complaint about your societies not registered ?—We have some complaint on this score, because a circular has been issued by the Registrar of Co-operative Societies informing Assistant Registrars not to register societies in the Dacca Division, because the Central Society cannot look after them. When we asked for organisers we were refused assistance. So far as I know, the circular has been withdrawn.

20995. It has been withdrawn ?—When the circular was issued, we were not informed at all. I do not know for certain whether it has been withdrawn or not. So far as I believe the circular is not in force. That is my impression.

20996. You have no longer any complaint or difficulty on that point ?—Three days ago the registration of one society was withheld on account of the circular I believe. But many other societies were registered in spite of the circular. I have still a complaint to make. The bad effect of the circular is still being felt.

20997. Then you mention in the supplementary note of yours that you are anxious to improve the water-supply. You asked for a loan of two lakhs two years ago and you offered securities but you have received no reply. Is that the position ?—Yes. There was a talk between me and the Registrar of the Co-operative Society who showed me the file. He told me that the Government insisted that we should pay the interest. We said that in the matter of water supply the societies could not tax the people using the water, therefore they could not pay any interest. Even without the help of the Government loan we are giving loans to co-operative societies bearing no interest. We have not since heard whether the Government have rejected the proposal or whether it is still pending.

20998. Your object was to prevent the sum of money sanctioned by Government for water-supply from lapsing ?—Rs. 2,50,000 is sanctioned every year by Government which is utilised for giving help to villagers in the proportion of two-thirds from the Government fund and one-third raised by the villagers themselves. Even that one-third cannot be raised by the people. So we are offering to the co-operative society that one-third in the shape of a loan or some portion of it, so that they may get the benefit of the Government grant to the extent of two-third. In this way they will be able to have their water-supply.

Later on they can pay off their loan. They can pay it in four or five years. There was a meeting which was presided over by Lord Lytton and in that meeting we were assured that we would get the money. The Registrar of Co-operative Credit Societies also said to the same effect. The Secretary to the Local Self-Government was also there and he also assured us that we would get the money. The proposal, however, has not passed through the Government machinery and we do not know what has become of it. They all told me at the meeting that it was a very nice idea because a large number of villages in Bengal would have their water-supply. Somehow or other the matter has not yet materialised.

20999. I hope you have not given up your efforts ?—Not yet. But we have latterly become very despondent on account of the delay in getting the money.

21000. Patience and perseverance may win in the end ?—Let us hope so.

21001. Are your societies philanthropic societies ?—No. They are based on self help.

21002. Do all these cultivators work honorarily on these peoples' societies ?—Yes.

21003. Your function is only to combat malaria or do you also deal with other diseases ?—Our societies deal with those diseases which are preventible and not with those which are non-preventible like dyspepsia and other diseases.

21004. Do not such diseases as can be prevented by inoculation come under your purview ?—Yes, they do.

21005. Sometime ago in the Punjab there was a fish exhibited which they said lived on the larvæ of the mosquito ?—We also do advocate that.

21006. But does it do any good ?—It does. In Bengal it is to be found in ponds.

21007. What do you call it ?—In Bengali it is called *techoka* (*haplochilus ranchuk*).

21008. I have heard there was an injection fund for *kala-azar*. Is it working now ?—It is working and we are quite confident that if we are not obstructed we will be able to tackle this problem of *kala-azar* within the next two or three years.

21009. Has it been a success ?—It has been a marked success.

21010. Have you also been successful in combating dengue fever ?—We do not get much of dengue fever in Bengal.

21011. The proper medicine for malaria as every one knows is quinine ?—Yes.

21012. Do you attempt to sell quinine at a very cheap rate ?—We get the quinine from Government for our society and we give it absolutely free. When the malaria season is on, people are given doses of quinine so that they may not suffer from malaria.

21013. Is there any particular season of malaria ?—It is generally from September to October.

21014. Just when the paddy ripens ?—No, just when the water stagnates. It is a that time that the breeding of mosquitoes starts and the malaria season begins.

21015. You told me this morning that there were certain paddy tracts where there is no malaria ?—Yes, it is Basirhat and Diamond Harbour.

21016. Have you investigated the reason for malaria ? Is that due to soil ?—It is due to gross negligence on the part of the people not to observe ordinary sanitary precautions.

21017. You mean that they do not take quinine ?—No, they allow the water to stagnate everywhere. The paddy crop by itself has got nothing to do with anti-malaria.

21018. So the stagnation of water causes malaria ?—Yes.

21019. Have your societies been able to combat the disease of malaria ?—Wherever we have tried we have been able to do it.

21020. As the people of Bengal are subject to malaria, do the Insurance Companies charge higher rates of premium from them ?—I do not know anything about that, but most likely they do not charge Bengalees higher rates. I have myself been insured and they did not charge me any higher premium because I am a Bengalee.

21021. Is it not the case that malaria is more prevalent in rural areas than it is in the urban areas ?—That is quite true.

21022. Does not the giving of votes, according to the new Reformed Constitution, interfere with your work ?—I do not know much of politics. I am so much engrossed in my work that I cannot think of politics.

21023. *Sir Thomas Middleton :* In answer to the Chairman you indicated the difficulty of altering the food habits of the people. Is it within your knowledge that in Bengal the usual dietary contains too much rice and too little *dal* ?—I have not thought over the question because as a medical man I do not think there is much in it. There are so much epidemic diseases that carry them off in thousands, so it does not matter which diet they take. Malaria is alone killing them in thousands, so it does not matter which diet they take. The malaria is killing them in thousands and we cannot prevent it, whereas all the world over they have actually banished it. The dietary, in my opinion, is a very small matter.

21024. Do you think that if the people were better fed, malaria would not prove fatal ?—If the people are free from malaria, they would be able to live on any kind of food, even on the food which they grow in their own field. But if the people are suffering from fever they cannot even remove the products of their labour from the field.

21025. So you attach primary importance to the infection and not to the nutrition of the individual ?—Yes.

21026. *Sir Ganga Ram :* Is it not a fact that in the urban population people are in the habit of taking rice only once a day, either in the morning or in the evening or *vice versa* and wheat at the other time ?—I do not know much about it.

21027. Is it within your knowledge that those who can afford to take wheat do take it once a day ?—I have not thought over the matter.

21028. *Mr. Gupta :* You say that your societies are gradually coming into closer contact with the local bodies such as Union Boards. You also said that it was quite natural and you are not against this movement ?—I am not against this movement.

21029. I suppose the reason is that the functions of both these bodies, namely, the anti-malaria societies and Union Boards, are really the same ?—Yes.

21030. The guiding principles of both these institutions are really the same. They are both non-official bodies ?—My idea is a little different. The Union Boards are too much being influenced by the officials and are becoming official bodies. Our idea is to make them a little less official and more non-official.

21031. There is the official influence ?—Yes, by nomination system they officialise these Union Boards altogether.

21032. But all the members are non-officials. Is it not true to say that you cannot have a single official member on these bodies ?—Yes.

21033. There is not a single member of a Union Board who is an official ?—No.

21034. What I mean to say is that both these Union Boards and these anti-malaria societies have the same object in view, namely, to teach the people to help themselves. Therefore, in principle, there is no antagonism between these two bodies ?—There ought not to be.

21035. What is happening now is that the Government aid is given for health work and these bodies are helping your societies ?—Only the bigger bodies are doing it. The Union Boards have not yet learnt public health work. They are too much engrossed in *chowkidari* work. For them a little training is still required. They are not yet so efficient as they ought to be.

21036. You want them to take a little more interest in sanitation ?—Yes.

21037 *The Chairman :* What is the lowest rung of your purely official organisation ?

Mr. Gupta : Nothing below the Sub-divisional Officer. There is also the Circle Officer to look after these Union Boards.

21038. *The Chairman :* What about the Local Board ? Is that an official body ?

Mr. Gupta : There is no official on the Local Board.

21039. *The Chairman :* Is the District Board, in fact, the smallest purely official organisation ?

Mr. Gupta : There are only four members out of 32 who are officials. So it is also practically a non-official body. The Chairman is non-official and there is a great majority of non-official members. In fact, not more than one-fourth of the elected members can be officials according to law. So, there is hardly any element of official influence in that body also.

21040. *The Chairman*: We are interpreting the word 'official' in rather different ways.

Mr. Gupta: You mean official influence ? There cannot be more than four members.

21041. *The Chairman :* Constituted according to Statute ?

Mr. Gupta : They are all constituted according to Statute.

21042. *The Chairman :* Including the Union Board ?

Mr. Gupta : Yes.

21043. A word about the assistance you are getting from Government. You got a fair sized grant the year before this work ?—Yes.

21044. And this year ?—Nothing was given until late this year. We are told we would get a grant but all sorts of conditions were attached to it. We said we would not touch the money under those circumstances, and the conditions have since been relaxed.

21045. What was the condition to which you objected ?—The officers were to get Rs. 100 a month and were not allowed to practise.

21046. The doctors in charge of cholera centres ?—Yes. They were to attend three centres, to have a servant on Rs. 10 a month, work six days and have one day's rest, and such and such medicines were to be given.

21047. There was too much red tape and official routine ?—Yes.

21048. You objected to that ?—Yes, and I saw His Excellency the Governor and through his influence these conditions have since been relaxed and we were able to take a grant of Rs. 5,000 and I believe we will get Rs. 5,000 again.

21049. Government offered their contribution under conditions which you thought rather too stringent and which were being reconsidered ?—Yes.

21050. In addition to the Government grant, some District Boards also assist the movement ?—Yes.

21051. The District Boards are also doing what they can ?—Certainly.

21052. So I hope this organisation which you have started, and for which so much credit is due to you, is not going to die ?—I hope not.

21053. You are getting some support, but not in the shape you want ?—That is my view.

21054. You get the assistance of the Public Health Department ?—Yes.

21055. You are in close touch with Dr. Bentley ?—Yes.

21056. He is the Government officer who deals with those matters, so I am sure your views will receive the utmost attention from Government, and as representing one division I can assure you my officers will do all in their power to help ?—Thank you.

21057. *The Chairman :* Who acts as Secretary of the Union Boards ?—A paid man, getting Rs. 20 a month.

21058. Who pays him ?—The Union Board authorities.

21059. *Professor Gangulee :* You have raised many controversial points in your precis to which I will not refer, but I wish to ask you one or two questions about your anti-malaria society. It was started in 1917 ?—Yes.

21060. You say up to now you have got 1,000 societies ?—Yes.

21061. In how many years ?—Eight or nine.

21062. From the figures you give here I find that altogether some 1,900 societies have been started. Do I understand something like 2,000 societies have been started out of which 1,000 have survived ?—No.

21063. I see from page 62* that 2 societies were formed in 1917, 3 in 1918 and so it goes up to 869 in 1926 ?—No, these are the total numbers.

21064. You began your society in your own village ?—Yes.

21065. Did you hold any office on the local body then ?—I was a Municipal Commissioner.

21066. For how long ?—Nearly twenty years.

21067. For twenty years you had experience of Local Self-Government ?—Yes.

21068. At the time of forming your society did you actually hold any office ?—Yes.

21069. Do you still ?—In the Municipality ?

21070. Yes ?—No.

21071. In the District Board ?—No. I have been asked to join the *Kala-azar* Board but not as an elected man.

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*The Sixth Annual Report of the Central Co-operative Anti-Malaria Society, Ltd.

21072. You stay most of your time in Calcutta ?—Yes.

21073. With regard to the subsidy question, I see from your list you have 34 doctors ?—Yes.

21074. Out of which 22 serve in the 24-Parganas ?—Yes.

21075. Only three serve in Howrah ?—Yes.

21076. Therefore there are 25 round Calcutta out of 34 ?—Yes, but since that report was written their number has almost been doubled, and we have got men in Hooghly and Burdwan and elsewhere.

21077. The point I am on is this. You have now about 1,000 societies ?—Yes.

21078. I find your activities are more or less confined to the urban areas and areas round the urban areas ?—No, we operate in rural areas mainly.

21079. It does not seriously touch the rural areas ; it is mostly round Calcutta ?—No, it reaches the villages of the interior.

21080. *Mr. Gupta :* The area of the 24-Parganas is 5,000 square miles, so it goes very far into the interior ?—Yes.

21081. *Professor Gangulee :* Your activities are principally confined to the 24-Parganas ?—I would not say that.

21082. Out of the 34 subsidised medical officers, 25 are confined to this district ?—But since then we have developed very much.

21083. You have three in Howrah ?—Yes, and Burdwan has been developed very much.

21084. To what extent do the honorary medical officers render services to your society ?—They are practising in the locality, and they take charge of *Kala-azar* centres and deal with cholera cases and tell the people what precautions to take.

21085. These honorary medical officers actually visit the rural areas ?—Yes ; they are practising there.

21086. What are the functions of the medical volunteers ?—They go out from Calcutta.

21087. They are Calcutta boys ?—Yes.

21088. Your motto is "Self-help, not Charity" ?—Yes.

21089. But from your cash account I find donations from the public were Rs. 33,500 and grants from Government and other sources Rs. 1,70,000. How much actual self-help money has come in ?—That does not affect the central society.

21090. That is philanthropic ?—Yes. The central society is absolutely philanthropic and no one reaps any financial advantage from it, but the village societies are true self-help societies. We encourage the formation of societies on a self-help basis, but our central organisation is not on that basis ; it is not even co-operative. We have given it a co-operative form because we want it registered under the Co-operative Department, and so we issue shares, but shares do not bear dividend.

21091. There is nothing co-operative really about the Central Co-operative Anti-Malaria Society ?—No.

21092. "Co-operative" is a misnomer ?—Yes.

21093. You complain you do not receive sufficient financial assistance from the Government, but I find here the Government assistance comes to about Rs. 70,000 ?—Yes. The total is about Rs. 1,00,000.

21094. Besides personal grants from men like Lord Ronaldshay ?—Taking everything it comes to about Rs. 1,00,000.

21095. *Rai Bahadur Banerji :* In how many years ?—Seven or eight. The first year we had Rs. 10,000.

21096. *Professor Gangulee :* Do you have any recurring grant from any source ?—No.

21096*a*. These grants are given only once ?—Yes.

21097. With regard to your work, on page 35* it is stated that the total amount expended on kerosene for fighting malaria was Rs. 325-13-3. That seems exceedingly small ?—

You are under a misapprehension. Our Central Society has nothing to do with the actual Anti-Malaria work ; the village societies do that. They have their own funds. We occasionally give them a little lead, that is all.

21098. You have only given these societies Rs. 325 worth of kerosene ?—We do not feed the societies in that way ; they are self-fed. Occasionally we give a little to some

Vide footnote on page 235.

societies just to give them a helping hand, but that is all. This year we did not give them a single anna's worth of kerosene.

21099. From the reports you have submitted to us we cannot get an idea of the actual working of your village societies ?—It would require quite a big volume to contain the reports of all these 1,000 societies. They publish their own reports themselves.

21100. On page 225 of your note you say "large sums sanctioned by Government for water-supply are not utilised and got lapsed year after year". Can you give us instances of that ?—No, but that is what I have been told by the District Boards. Only yesterday I heard from a District Board that they would not utilise the money but were returning it.

21101. You cannot supply this Commission with any actual facts ?—No.

21102. This statement is merely your impression from hearsay ?—Yes.

21103. *Rai Bahadur Bannerji :* But it is a fact ?—The District Board Chairman can testify to that.

21104. *Professor Gangulee :* You talk here of the sophistry of false economics.

21105. What do you mean by that ?—For example, in the case of the Panama Canal it was thought from an economic point of view it was bound to be a success, but the earliest efforts were vitiated by disease, and it was not until medical men were placed in charge that anything could be done. Health here contributed to economics.

21106. Have you studied irrigation problems from an engineering point of view ?—No; I am a medical man. I have seen the defects, however, with my own eyes; I have seen the terrible effects at Hardwar, where a number of people contract malaria through defects in the irrigation scheme. Malaria is also rife at Panchpur (Midnapore) because the water leaks through the *bunds*.

21107. *Mr. Gupta :* Did you bring this to the notice of the Irrigation Department of Government ?—I do not know whom to tell. You are an authority on these matters, and the least word from you would be of great assistance.

21108. *Dr. Hyder :* You are referring to Hardwar and Dehra Dun districts ?—Yes.

21109. You say malaria is intense there ?—Just three months ago I was there; I saw a number of people were suffering from malaria.

21110. Do you possess definite information on that point ?—Once in a season I went there and found the people suffering from malaria.

21111. Do you ascribe that to the influence of water ?—No. I went to the Ganges Canal and saw the gate of it closed, but water was trickling down because it was not properly closed; there was stagnant water all along the canal. I examined the water and found millions of larvæ in it; each one of them would become a mosquito and if a mosquito bites one man suffering from malaria any number of people would be infected. There was a school, I think the Rishikesh school, and they told me that all the boys there were suffering from malaria and the school had to be closed for the time being. All this is simply due to the fact that the flood gate was not properly closed. If the irrigation canal had been constructed properly no water would have trickled down and there would have been no difficulty.

21112. *Professor Gangulee :* You have not brought this to the notice of the Government at any time ?—No. But this I saw myself and I brought it to the notice of the authorities of the Gurukul school.

21113. I know that school and His Excellency the Governor of this Province takes interest in it ?—Yes.

21114. You are in touch with Dr. Bentley ?—Yes.

21115. Did you bring this matter to the notice of His Excellency or Dr. Bentley ?—It is not in Bengal; it is in Hardwar.

21116. I am referring to this particular thing ?—Yes; I had a talk with Dr. Bentley.

21117. One question with regard to Local Self-Government. Here you say you depend on natural leaders, born leaders. You say "In the interior of rural areas, this all important lead used to be given by some one among themselves, who were able to give it on account of their comparatively superior intelligence and are so to say, born leaders who become so, not by any election process, but by natural process. I have not been able to find out whom you mean, what type of leaders?—The old type of village mandals. They were a little more expert and clever than their co-villagers.

21118. Are you a born leader or an election leader ?—I do not meddle in elections.

21119. *Mr. Kamat:* I wish to know whether these public health societies of yours are educating the village people in the principles of general hygiene and sanitation or whether they are confining themselves only to anti-malaria work ?—They are anti-malaria and public health societies and so they do anything and everything.

21120. You mean you teach the people how to keep sanitation in their houses and around their houses ?—Yes; the main disease being malaria, we lay special stress on that.

21121. You lay stress on malaria and you also educate public opinion in villages about sanitation ?—Yes.

21122. Since 1917 up till now you have organised 1,000 public health societies ?—Yes.

21123. Is it not the case that, as we stand at present, most of the activities must radiate from urban to rural areas in India ?—You mean our activities or the activity of the villagers ?

21124. General activities. As the intelligentsia are in urban areas, is it not inevitable that they radiate from urban areas to rural areas ?—Yes, it is. But I would rather prefer that it should begin from the rural areas because it will take centuries if we have to depend on this information going from the cities to the rural areas. They will be wiped off before we reach them.

21125. So they should emanate from the bottom ?—Yes.

21126. But as the intelligentsia are in the towns, is it not inevitable that they must radiate from the urban areas ?—Yes.

21127. You have been assisted in this splendid work by your medical friends ?—Yes.

21128. Do other people, other than the medical graduates, assist you in this rural welfare work ?—Yes. It is simply due to the efforts of the medical men of Bengal. I take pride in that, that our medical profession is helping us splendidly and the success is simply due to that.

21129. In that splendid work of yours is it the medical graduates only who help, or are you being assisted by such people as college men or college professors ?—No; we do not get much assistance from them.

21130. *Rai Bahadur Bannerji:* You have told the Commission that you have altogether about 950 rural societies of which 700 are active and about 250 are dying or dead and all these have been formed in the course of the last 9 years ?—Yes.

21131. It was latterly that the development was very rapid ?—Yes.

21132. In addition to that about 300 are registered co-operative societies ?—Yes.

21133. You have also told us that you are more in touch with the Union Boards than with the Co-operative Department for your help ?—Yes.

21134. The Government grant which is being allotted for the purpose of sanitation is distributed through the agency of the Union Boards ?—Up till now it was given direct from the District Board, but only this year it is being given to the Union Boards and we are told that it has rather retarded the movement because of the Union Boards not appreciating public health work very well. It has retarded the movement and I believe a letter of protest against it was sent to the Director of Public Health and it was also sent to the papers.

21135. Whatever may be your opinion, the Government have thought fit to have the agency of the Union Boards as the proper one for distribution of the sanitary grants to your anti-malaria societies ?—Yes.

21136. For which purpose they have to be registered ?—Yes.

21137. An unregistered anti-malaria society will have no grant-in-aid from the Union Board ?—None.

21138. We understand that the Registrar of Co-operative Department has suspended or stopped, as the case may be, the registration of several societies because they are not on a sound and economic basis ?—No, that is not the fact. The main idea is that our Central Society can discharge its functions better for those districts near Calcutta; but we will not be able to do our part for those which are situated at a long distance from Calcutta. That is the main consideration. He told me that he wanted to force the hand of Government in order that they would give money for organisation so that we might be in touch with the distant districts. He said he was in opposition to us in order to help us; that was his idea.

21139. So you understand that this temporary suspension of registration is due to the Co-operative Department not having sufficient staff for supervision ?—Yes.

21140. If it be a fact that this temporary suspension is due to these societies not being formed on an economic basis, how will that affect your organisation ?—That complaint I have not heard as yet.

21141. You have said in the course of your evidence that you live in Calcutta ?—Yes.

21142. Do you not go to your village or villages every Saturday and Sunday ?—Every Sunday I do go and see some of the societies situated outside.

21143. While you were talking of this Hardwar canal mischief, was it in your mind that the prevalence of malaria was due to irrigation or to the defects in the embankment and in the closing of the gates ?—It was due to the defects.

21144. In this lowest rung of Local Self-Government, the Union Boards, if the official influence of the subordinate officer and upwards be withdrawn all at once by the Government, do you think the Union Boards will exist at all ?—I do not know much about it. But at any rate I say the Union Boards are too much under the thumb of these officials who act under the orders of the Sub-divisional Officers, so much so that it is nothing but an official organisation now. But I hope gradually in course of time that will change.

21145. Our people might be sufficiently well educated in their own methods of doing things. But are they at all educated to adopt these western institutions of Local Self-Government all at once unless there be agencies to teach them in these days ?—My idea is a little radical. I have studied the Local Self-Government institutions of England a little, and I am of opinion that the system should be adopted here without much modification at once. The local bodies of England are perfectly autonomous. The power of Central Government is represented in what is called Local Self-Government Board. This consists of best medical men, bacteriologist and engineers as its officers. Over them all is a man of the position of a cabinet minister. The work of the local bodies is judged solely by the birth rate and death rate which is published every week by the Registrar General of Births and Deaths. If the death rate of any local body goes up, the Board sends its medical officer for inspection; if he finds any fault in the local body or any jobbery taking place such as the Chairman appointing his son-in-law as the Health Officer without looking into his qualifications, the public opinion being sufficiently enlightened, suffices to remove the Health Officer. They know that through the fault of the Health Officer they are suffering from tuberculosis or typhoid fever. But if the Health Officer is kept in his place in spite of the remarks, the ordinary arrangement is that the parliamentary grant of the local body is withheld. That is the way the people of England do their work. In England people and the Government come into direct contact through the Local Self-Government Board. The order issued by the Board is more to the point, as it emanates from experts. But here we have an officer in charge, who knows nothing about sanitation. His orders are more for efficiency, than for solution of public health problem. For this reason, the people not having the autonomy and the proper lead from Government, cannot do away with the epidemic diseases. If they get the power, training and the lead and proper legislation, as they have in England, the epidemic diseases will be done away with in no time. Then the Local Self-Government will develop as it has developed in England. My belief is that our country's future depends entirely on development of Local Self-Government. It is in this way that we will develop proper *swaraj* and not in the way it is developing now. When people are trained in Local Self-Government we will have the proper type of men in the Legislative Councils, men who are trained by managing their own local bodies, instead of the type of men we are getting now.

(The witness withdrew.)

Dr. C. A. BENTLEY, M.B., D.P.H., D.T.M. & H., Director of Public Health, Bengal

Replies to the Questionnaire

QUESTION 1.—RESEARCH.—(*a*) (*b*) and (*c*) Under this head, I wish to emphasise the immense importance of statistical research regarding agriculture and allied subjects. Few countries in the world possess more abundant or better statistical material than is available in India. But although this material is being added to year after year, at present little or no use is being made of the data owing to there being so few people who possess an adequate knowledge of modern statistical science.

Statistical science and its application has made very great strides in recent years, especially in America, and as a result a knowledge of rainfall cycles, harvest cycles, and trade cycles, has become almost a commonplace in commercial and other circles in that country. The statistician is regularly consulted in America and I know of at least six private statistical bureaux there that are prepared to supply statistical information in regard to almost any conceivable subject in return for a fee. But in India, as in Great Britain, the value of the statistician is not yet understood and the work of statistical departments mostly stop short at the compilation, abstraction and publication of tables of figures. The only use that is usually made of statistical data is when a little of it is selected for the purpose of "special pleading" or for bolstering up some particular view. This prostitution of statistics has led to the common jeer: "*Lies, damned lies, and statistics*"

Yet, without statistical science, all the biological sciences are fruitless—for just as chemistry and physics cannot be pursued without the aid of mathematics, so all the sciences concerned with the study of life, whether in plants, or animals or human beings, are helpless without the aid of statistical science. The need for statistical research in connexion with agriculture in India is very great. More than ten years ago Professor Moore of Columbia University demonstrated by modern statistical methods the existence of rainfall cycles and harvest cycles in America. Subsequently he worked out the harvest cycle for Europe. His work has been followed up by many others and at the present time any one conversant with the economic and statistical journals published in the United States must be aware of the immense emphasis that is now being attached both to harvest and trade cycles in that country. Evidence of similar cycles in the rainfall, the harvests, disease and many other factors can easily be discovered in India by synthesis of the existing statistical data. In this connection I attach a reprint* of an article by Mr. J. Bowie, published in the *Statesman* in 1924, and at the same time I would call attention to the latter portion of my own printed note† on Bengal malaria.

In conclusion, I wish to urge upon the Commission, with all the emphasis I can command, the immense good that is likely to result from adequate statistical research into agricultural trade and meteorological conditions in India.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(*a*) Personal investigations in certain rural areas of Bengal have led me to the following conclusions:—Broadly speaking, from the point of view of indebtedness, every village population can be divided into three classes: (*a*) lenders, (*b*) borrowers and (*c*) persons too poor either to lend or to borrow. It is my experience that cultivators who possess assets of any value and who are not themselves the lenders of money to others are invariably in debt. Contrary also to what is often believed, the amount of a cultivator's indebtedness is ordinarily a measure rather of his position and prosperity than of his poverty.

Agriculturists in every part of the world as a class invariably depend upon credit to enable them to live while they prepare the land and bring their crops to maturity. Consequently the indebtedness of agriculturists cannot be considered a phenomenon peculiar to India; neither can it be explained by charges of special extravagance or loose living on the part of Indian cultivators. If agriculturists were not in debt, the observers who now blame their supposed extravagance would have nothing to say to their heavy expenditure on marriages, funerals, etc. I do not deny that from the western standpoint much of this expenditure seems wasteful; but we have always to remember that it is the conventional thing; and the normal man, whether he be European or Indian, is still a slave to the conventions of his class and period. The indebtedness of cultivators is due therefore in the first place to the universal necessity for obtaining credit to which agriculturists all over the world are exposed; the sources of their credit are in the main that class of local moneylender which is created by this demand for credit; and the chief reason preventing repayment is the fact that such repayment is ordinarily sought neither by the borrower nor the lender. A borrower, in my experience, is almost invariably in debt to the fullest

* Not printed.

† Not printed. "Malaria in Bengal" by Dr. C. A. Bentley, Bengal Government Press, Calcutta, 1926.

possible extent of his credit. He considers his credit as a commodity which he exchanges for cash, and he regards the moneylender as his banker from whom he has a permanent overdraft, and to whom he goes whenever he has need for money. It must not be understood from what I have said that I consider that indebtedness is not an evil. On the contrary, it is a very great evil. But I maintain that, unless its real nature is understood attempts to reduce it cannot possibly succeed. Up to the present, every effort at preventing or controlling agricultural indebtedness has failed and the special legislation designed for this purpose has everywhere been abortive. The only rational method of dealing with the question is to regard agricultural indebtedness as a necessary evil, to be gradually reduced by establishing land banks, loan agencies and co-operative credit societies to compete with the existing moneylender class by offering better terms of credit. Meanwhile, the spreda of education, the growth of public opinion and the gradual evolution of different standards of living that will condemn instead of encouraging wasteful social expenditure will do more to diminish indebtedness than any mistaken and misdirected attempt to abolish, reduce or control it by legislation or direct Government action.

QUESTION 8.—IRRIGATION.—The whole question of irrigation is dealt with at length in my recent Report on Malaria and Agriculture, copies of which are attached. Meanwhile I may point out that the districts mentioned below are greatly in need of irrigation, and that many other districts also require it :—

(1) Burdwan,
(2) Birbhum,
(3) Bankura,
(4) Midnapore,
(5) Hooghly,
(6) Howrah,
(7) Nadia,
(8) Murshidabad, and
(9) Jessore.

The forms of irrigation most urgently required are non-perennial canals and tanks and ponds but the whole matter requires the most careful investigation. With adequate irrigation facilities, Bengal could feed the whole of India. If the existing rice-fields of Bengal gave a yield per acre as high as those in Spain, they would suffice for this purpose. If they yielded as well as the rice-fields of Japan, they would feed 200 millions of people. " Any country ", says Sir William Willcocks, " which possesses rivers and streams whose waters are in flood for six weeks per annum at a suitable season of the year can betake itself to basin irrigation with more or less profit. The science of dams, weirs and regulators has received such development during recent years that there can be no problem so difficult that it cannot be solved by experience and originality. Basin irrigation allows of the thorough development of countries that have streams with short and turbid floods which precede a fairly cool season ; whether such irrigation be the stately irrigation of the Nile Valley, perfected by the science and experience of 7,000 years ; or the less perfect but still highly effective and river-fed tank systems of Madras ; or the primitive but effective basins of Bundelkund, where impounded water irrigates the crops on the down-stream sides of the basins for one season and then allows of the basins themselves being dried and cultivated in the next."

The above words apply with special force to Bengal, where the rivers are all in flood at a suitable time of the year, preceding a fairly cool season. Moreover, at one time irrigation used to be practised on a very extensive scale in Bengal. The Burdwan Division even now possesses thousands of tanks which were formerly used for irrigation purposes. An examination of the old survey maps on the 1" scale will show what an enormous number of tanks were once in existence. At this time, the country was not protected from inundation by continuous river embankments and the tanks were partly fed by river overflow in addition to local rainfall ; moreover, the subsoil reservoir was likewise annually replenished and the water-table kept at a high level as a result of the recurring inundations. At this period, the Burdwan Division was *the most prosperous and progressive Province in the whole of India.* But since 1860 conditions have greatly changed, especially in the Burdwan district, where, owing to the confinement of the Damodar river to its bed by marginal embankments, the country has been deprived of needed moisture. The rainfall of Western Bengal is relatively scanty and by itself wholly insufficient to allow of the intensive cultivation of the area that was cropped under former conditions. There has therefore been a progressive diminution in the net cropped area. Meanwhile, many of the tanks have dried up, and the subsoil water becomes so greatly reduced at the end of the dry season that its level is far below the surface of the country. The former simple system of tank irrigation has thus become greatly disorganised, and agriculture has in consequence suffered a serious decline, accompanied by a progressive loss of population. In this connection, I would refer the Commissioners to my Report* on Malaria and Agriculture in Bengal, and especially to the graphs opposite page 8 of that report, which show the progressive decline in the net cropped area of

* Bengal Government Press, Calcutta, 1925.

Burdwan since 1890. This is now a little more than half of what it was forty years ago; moreover only 5 per cent. of this area is twice sown because the supply of moisture is so small. The cause of this lack of moisture may be more readily grasped when it is pointed out that at the end of the dry season the subsoil water-level lies at an average depth of 26 feet below the surface and in some parts of the district wells 60 feet deep are dry in May. A foot of loam soil will hold 4 inches of water when fully saturated. So that (assuming the soil of Burdwan to be loam) it would require at least 104 inches of water to raise the subsoil water-level of that area to the surface, a condition necessary where winter rice is to be grown. But the average monsoon rainfall of Burdwan is less than 50 inches so that in the absence of supplementary supplies of water only a relatively small proportion of the district can be planted with wet crops even in favourable seasons. Conditions are equally unsuitable for dry crops also, hence the small area sown. Meanwhile, year by year enormous volumes of water flow through the Burdwan district unused, often causing immense flood damage in lower lying tracts which at present continually receive more water than they actually require.

Obstacles to the extension of irrigation.—One of the chief obstacles to the extension of irrigation in Bengal is the prevalent belief that, owing to the abundant rainfall it is quite unnecessary. Thus the late Lord Curzon expressly stated in his speeches on the subject that irrigation was unnecessary in Bengal. But although in those speeches he was dealing primarily with the question of famine prevention, his words encouraged the notion that irrigation was not required in Bengal, and as a consequence little or no attention has been paid to the subject. For many years, therefore, the Public Works Department (Irrigation Branch) has confined its activities mainly to drainage schemes. One of the results of this policy is that to-day Bengal possesses few or no experts with practical acquaintance with modern irrigation practice, as carried on in the Punjab, Madras, the United Provinces, Sind and other countries, such as Egypt, Italy, France, Spain and America. This is obviously a serious obstacle to irrigation in Bengal.

Other serious obstacles are the Permanent Settlement and the land tenure system of Bengal. Irrigation cannot be administered in Bengal in the manner customary in places where a ryotwari settlement system is in force, and because of this the two projects that were carried out in the Province many years ago, *viz.*, the Midnapore Irrigation Project and the Eden Canal Project, do not give satisfactory financial results to Government. There has thus been no great inducement for incurring further capital expenditure on irrigation schemes. But irrigation is so badly needed in Bengal that methods of administration specially suited to local conditions will certainly have to be devised.

The existing methods of distributing canal water in the case of the two schemes mentioned above are not satisfactory for the reasons explained in paragraph 250, pages 181-182 of my Report on Malaria and Agriculture.

QUESTION 10.—FERTILISERS.—The question of natural fertilisation of the soil by irrigation with silt-laden river water is dealt with in my Report on Malaria and Agriculture, copies of which are attached.

QUESTION 16.—ANIMAL HUSBANDRY.—It has long been admitted that under-feeding is one of the chief causes of the miserable physique and poor quality of the cattle and other live-stock in Bengal. Fodder crops are almost non-existent and the lack of moisture in the soil during the dry season prevents the growth of grass at that time of the year. Cattle are chiefly fed upon rice straw and what they can pick up on waste land and along the roads. These facts emphasise the need for irrigation, which would do much to remedy the existing shortage of fodder, thus helping to improve the cattle and other live-stock of the country.

QUESTION 22.—CO-OPERATION.—(*See* pages 19 and 27 of printed note on Malaria in Bengal, and pages 119 and 120 of Report on Malaria and Agriculture.)

Some years ago, I strongly recommended to Government's notice a movement on co-operative lines for dealing with malaria and improving the health of village communities that had just begun to take root in Bengal under the auspices of a Central Co-operative Anti-malaria Society. Thanks to the untiring efforts of the originator of the movement, Rai Gopal Chandra Chatterjee Bahadur, M.B., there are now many hundred branch co-operative public health societies in Bengal to-day. It is impossible in the brief space at my disposal to describe the immense good that has already been accomplished through their agency. I would strongly urge that the Commission should take the opportunity of securing evidence in regard to these societies from Rai Gopal Chandra Chatterjee Bahadur, in person. In my opinion, a very large proportion of the societies, which he and his organisation have succeeded in establishing, have in the main achieved their aim, *viz.*, the awakening of Bengal villagers to the necessity and the possibility of improving the health of their villages by their own efforts.

Dr. C. A. Bentley.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(*a*) It is not easy to give an exact estimate of the number of days of work done by an average cultivator on his holding during the year, because conditions vary in every district as may be seen by the following figures extracted from the "Agricultural Statistics of Bengal" for the year ending June 30th, 1924:—

Districts	Twice sown	Net cropped area	Percentage twice sown
	Acres.	Acres.	
Burdwan	36,300	814,200	4·5
Birbhum	14,100	590,500	2·4
Bankura	37,700	627,800	6·0
Midnapore	88,400	1,745,800	5·1
Hooghly	10,500	285,300	3·7
Howrah	20,000	110,400	18·1
	207,000	4,174,000	5·0
24-Parganas	66,500	807,800	8·2
Nadia	207,100	676,000	30·6
Murshidabad	107,400	429,700	25·0
Jessore	40,900	1,028,500	4·0
Khulna	97,400	761,100	12·8
	519,300	3,703,100	14·0
Rajshahi	188,800	900,800	21·0
Dinajpur	10,000	1,031,800	1·0
Jalpaiguri	120,700	670,500	18·0
Darjeeling	16,900	148,400	11·4
Rangpur	....	1,226,100	....
Bogra	120,400	379,700	30·3
Pabna	191,400	835,100	22·9
Malda	50,000	549,800	9·1
	698,200	5,712,200	12·2
Dacca	277,200	1,309,000	21·2
Mymensingh	1,151,800	2,239,900	51·5
Faridpur	176,400	1,178,200	15.0
Backarganj	264,000	1,673,300	15·8
	1,869,400	6,400,400	29·2
Chittagong	59,500	622,800	7·6
Tippera	385,200	1,092,700	35·5
Noakhali	381,300	738,800	51·5
	826,000	2,454,300	33·6

These figures show that in the Burdwan Division only 5 per cent. of the net cropped area was sown twice during the year, whereas in the Chittagong Division 33·6 per cent

was sown more than once. Taking individual districts the variation is even more marked, for whereas only 1 per cent. of the land was twice sown in Dinajpur, in Mymensingh and Noakhali, on the other hand, more than half the net cropped area was twice sown. In the Province, as a whole, 18·3 per cent. of the net cropped area was twice sown.

It is generally admitted that at present, except at the special times of ploughing, sowing, weeding and final harvesting, the cultivators usually have little or nothing to do. If any useful subsidiary occupation could be found for them, their economic position could be greatly improved.

(*b*) The soundest method of encouraging the adoption of subsidiary industries seems to be the discovery or creation of a demand for produce. The most hopeful direction in which advance can be made is probably in the direction of encouraging existing industries.

The main obstacles to the expansion of such industries as poultry-rearing, fruit-rearing, sericulture, lac culture, rope-making, basket-making, etc., are to be found in the lack of necessary demand. The finding of suitable markets for the produce of these industries is thus all important, for markets create a demand, and an unsatisfied demand is a vacuum that nature abhors. Take the case of poultry-raising. Some years ago I saw many thousands of eggs in the Birbhum district waiting at railway stations for export to Calcutta. This shows some one had discovered that a profitable business could be done in these eggs, after collecting them and paying the freight. The eggs were not packed but merely put into large flat baskets and the breakages must have been heavy.

Fruit and vegetable culture is an industry almost entirely dependent upon the existence of a local demand as may be seen by examining the figures relating to the area under these crops in the various districts :—

Districts	Acreage devoted to fruit and vegetable	Percentage of net cropped area of district	Percentage of provincial acreage devoted to these crops
Noakhali	75,000	10·15	12·5
Backarganj	158,400	9·45	26·4
Howrah	7,700	6·97	1·3
Hooghly	12,900	4·53	2·2
Faridpur	50,300	4·27	8·4
Birbhum	22,500	3·81	3·8
Dacca	48,800	3·74	8·2
Mymensingh	82,300	3·66	13·7
Jalpaiguri	22,600	3·37	3·8
24-Parganas	20,700	2·56	3·5
Khulna	18,400	2·42	3·1
Rajshahi	21,100	2·33	3·5
Rangpur	26,600	2·17	4·5
Darjeeling	2,000	1·35	0·3
Dinajpur	10,200	1·00	1·7
Tippera	10,500	·96	1·8
Chittagong	5,900	·95	1·0
Bogra	3,500	·92	0·6
Nadia	6,000	·89	1·0
Murshidabad	3,600	·84	0·6
Midnapore	12,600	·72	2·1
Bankura	3,500	·56	0·6
Burdwan	4,400	·54	0·7
Malda	800	·54	0·5
Jessore	3,300	·32	0·6
Pabna	2,600	·31	0·4

The table above is prepared from data extracted from the Agricultural Statistics for 1924. In the Province as a whole, about 2·7 per cent. of the net cropped area is devoted to growing fruit and vegetables. In many districts however a much smaller proportion of the net cropped area is occupied by these crops. The places where this sort of culture

is already practised on a fairly large scale are obviously the most suitable for further development under this head.

Pisciculture.—Although there is everywhere a demand for fish owing to the fact that from time immemorial fish has formed a favourite diet in Bengal, the supply of fish has greatly diminished in many parts of the Province. The reports of the late Sir Krishna Gupta and of Mr. K C. De, C.I.E., I.C.S., are unanimous on this point. The cause of this diminution is to be sought in the gradual drying up of the streams and swamps and a general reduction of surface water. But even now in many districts an acre of water in the form of tanks devoted to fish culture is more profitable than a similar area of dry land. Owing, however, to the existing laws of inheritance many tanks are owned by numerous co-sharers who cannot agree upon the necessary steps for their upkeep, and as a result, they often tend to silt up and become useless. This same obstacle prevents others acquiring old tanks and improving them. Many difficulties are met with also when it is desired to excavate new tanks, for landlords have the right to prohibit work of this kind or to exact very heavy *salami*. The drying up of many parts of Bengal, formerly subject to annual inundation, as a result of the shutting out of flood water from the rivers and the almost total lack of artificial irrigation to replace the lost supplies of surface and subsoil water, is a further obstacle to the practice of pisciculture, which is thus rendered increasingly difficult in Bengal.

In this connection, the following quotation from a paper read at the Paris International Congress of 1889 by a Chinese statesman, General Schangte-tong, is not without special interest :—

"I may add that without these gigantic irrigation works, the Chinese could never have carried to such a pitch of perfection one of their most important industries. I speak of pisciculture. Thanks to the abundance of water, the whole of my countrymen, instead of contenting themselves with covering with their fishing boats the seas, rivers and lakes of our country, have devoted themselves to the breeding of fish. The spawn is everywhrre carefully collected ; far from leaving it to take its chance, the peasant gives this source of wealth a safe shelter in some spot where a perennial supply of water can be assured. The irrigation reservoirs teem with fish. During winter, the rice fields are fallow : the water is led into them, and they are instantly full of carp. This industry allows us to make fish a considerable factor in the food of our people. The fish are either eaten fresh, or salted, and dried ; they are despatched to all parts of the Empire and sold at a price which is remunerative, though it is exceedingly cheap.

Sericulture.—Sericulture formerly flourished in many parts of Bengal, but it has long been in a decaying state owing mainly to the loss of the export market for silk, which appears to have been gradually diverted to China, Japan, Italy and France. I have had personal experience of the disastrous effect of this upon the health of village communities in Bengal. In the Birbhum and the Murshidabad districts, for example, I have had occasion to investigate serious outbreaks of very fatal malaria in village population, caused apparently by the privation and distress following upon the closing down of silk filatures upon which many of the people were largely dependent. It would be an immense boon to the people of many districts if the silk industry could be revived. In this connection I may point out that in many parts of the Province, the Burdwan Division especially, wild castor plant, upon which the *eri* silk moth feeds, grows wild very luxuriantly. Provided a market can be found for *eri* silk, therefore, a thriving village industry could certainly be built up in many villages which would exert a most beneficial effect upon the health of the people.

QUESTION 18.—AGRICULTURAL LABOUR.—(*a*) and (*b*) There is a shortage of agricultural labour in many parts of the Province at certain seasons of the year, as is proved from the migration of such labour to certain districts and by the extraordinarily high wages that labour can often command.

Among the causes which produce or aggravate labour shortage, sickness or mortality must be mentioned. In malarious localities, a large proportion of the labouring population is often prostrated with attacks of fever at the very time of the rice harvest, so that sometimes the crops cannot be reaped. A comparison of the data regarding mortality, birth rate, and natural increase of the population shows that, contrary to what is often believed, *it is the death rate rather than the birth rate* which governs the natural increase of the population. Any measures that can be devised for reducing the death rate therefore will eventually lead to a considerable increase of the labour available for agriculture.

(*c*) The occupation and development of areas not at present under cultivation would be greatly facilitated by the adoption of irrigation. There are more than 6,000,000 acres of cultivable land lying waste in Bengal at present and a further 4,000,000 acres are lying

fallow. Most of this uncultivated and fallow land is situated in the northern, western and central portions of the Province. This land remains uncultivated chiefly owing to the fact that the available supply of moisture is insufficient for the purpose of raising crops. Yet every year enormous volumes of rich river water, a mere fraction of which would serve to irrigate the whole of this land, passes unutilised to the sea.

As I have pointed out in my recent Report on Malaria and Agriculture, irrigation is required not only for the purpose of improving existing agriculture and bringing waste and fallow lands under cultivation, but also for the purpose of reducing malaria. The latter object when attained would also increase the supply and efficiency of agricultural labour very greatly.

QUESTION 19.—FORESTS.—(*a*) and (*b*) The supply of fodder in many of the rural areas in Bengal, particularly in the Burdwan and Presidency Divisions, which is at present very deficient could undoubtedly be increased to an almost unlimited extent as a result of irrigation.

(*c*) The cutting down of *sal* trees which formerly covered large areas in the west of Burdwan, Birbhum, Bankura and Midnapore has been followed by very extensive erosion in these districts. There are large tracts now so denuded of soil that little or nothing will grow there and during the dry weather these areas resemble arid deserts of undulating laterite. Better facilities for irrigation are urgently required to enable cultivation to be gradually extended so that the land can be slowly reclaimed, and the process of denudation checked.

At present, the soil of these denuded areas is so poor and so dry for long periods as to prevent the growth of vegetation and consequently the rain that falls upon the undulating surface runs off very rapidly greatly increasing the existing disorganisation of the land surface. Expenditure on a system of contour drains and bunds is first required to divert the rainfall from these bare surfaces into irrigation tanks where the water may be stored for the supply of fields at a lower elevation. I believe much of the land could eventually be reclaimed by a system of terracing or Italian methods of colmatage.

(*d*) Heavy rainfall is almost always associated with the growth of dense vegetation ; and dense forests with heavy rainfall. It is reasonable to suppose, therefore, that whenever afforestation can be carried out, it must eventually exert a favourable effect in increasing rainfall. Probably also it often serves to increase the moisture in the soil although in certain circumstances it is supposed to have a contrary effect. There is reason to believe, however, that forests are specially beneficial by checking or regulating the flow of water over the surface of the country thereby preventing erosion.

(*e*) I am doubtful if there is any opening for afforestation in the neighbourhood of villages in Bengal and it might probably prove dangerous to health.

QUESTION 21.—TARIFFS AND SEA FREIGHTS.—(*a*) Existing export duties on jute do affect the prosperity of cultivators in certain Bengal districts adversely. The duty on jute is fixed at Rs. 4-2-0 a bale, irrespective of price and quality. It has been assumed that, because jute is almost a natural monopoly of Bengal, it can safely stand an export duty, and it is argued that this duty is necessarily borne by the consumer abroad. But this is a fallacy as is shown by the fact that since the imposition of the duty the world consumption of jute has ceased to expand. This latter observation is suggestive of the increasing use of various substitutes for jute. Apart also from the general effect of the duty upon the world demand for jute, the method of levying the duty bears most heavily upon areas producing the cheaper qualities of the fibre. The disastrous effect of this selective action may be traced in the case of the Pabna district, where the area under jute has progressively diminished since the duty was imposed.

Recommendation.—The duty should either be (1) greatly reduced or (2) totally abolished. It is probable that the local jute mill industry would object to its abolition, as it is believed to be rather favourable than not to the local manufacture of jute fabrics in competition with foreign manufacture. If the duty is not abolished, it should be reduced and a large proportion of the revenue derived from it should be devoted to benefiting the industry as a whole by stimulating the consumption and world demand for jute and improving by every possible means the cultivation of this important product.

Finally, as jute is of such immense importance to the welfare of Bengal, the control of all revenue derived from the duty should be vested wholly in the Government of Bengal.

QUESTION 25.—WELFARE OF RURAL POPULATION.—(*a*) Apart from the extension of the co-operative health movement for the improvement of village hygiene, which I have mentioned elsewhere, I am most anxious to see a further development in the direction of providing a sufficient number of assistant health officers and other subordinate

staff to enable us to combat epidemic diseases efficiently. Bengal was the first Province in India to appoint district health officers, but a single officer, however efficient, keen and conscientious, can himself do little to reduce sickness and mortality in the average district area of 2,700 square miles with a population of 1½ million people living in thousands of villages. The provision annually of less than one pice per head of the population would enable us to employ a health staff sufficiently numerous for the control and final eradication of cholera, small-pox and *kala-azar*. At the same time, it would provide for propaganda work that would teach the people the possibility of reducing malaria and other diseases by their own organised efforts.

(*b*) In communities almost wholly dependent upon agriculture, welfare and prosperity is not a fixed condition, but is constantly varying according as prices rise and fall and harvests are good, bad or indifferent, respectively. Moreover, villagers usually possess such vague notions as to their income and expenditure that it is often exceedingly difficult to obtain any exact information in regard to such matters. For example, few of them can tell what their domestic budgets amount to. Nevertheless the carrying out of a detailed economic survey might bring to light important facts and help to an understanding of many of the problems that require solution. Before, however, such a detailed survey as I have in mind could be carried out with advantage, it would be necessary, I think, in the first place to make a critical examination of the immense amount of statistical information bearing upon the economic condition of districts and their populations, which is already available, in order to obtain a clearer idea than can be given at present of the blanks in our knowledge that require more particularly to be filled.

(*c*) While I must disclaim having made anything in the nature of an intensive economic enquiry, such as is referred to in the question, I have from time to time, as opportunity offered, endeavoured to investigate certain economic questions affecting the health and welfare of communities in Bengal. As a result, I have found again and again that severe outbreaks of malaria have been associated with the existence of economic stress in the affected community. On numerous occasions I have shown also that evidence can always be found of a serious decline of agriculture in rural areas in which the census has discovered a marked reduction of population. I have also again and again observed that the occurrence of poor harvests and a high death rate are associated whereas good harvests are associated with low death rates. Some of these points are dealt with in my Report on Malaria and Agriculture and the printed note on Malaria in Bengal.

QUESTION 26.—STATISTICS.—(*a*) In this connection, I wish to utter a serious warning. I have had occasion frequently to examine and make use of many of the statistics relating to agriculture and other subjects that have been collected and compiled during the past thirty years in India. Again and again, I have discovered that the value of the data has been greatly reduced by some obvious change in the mode of collecting or recording the figures, or where estimates have been employed, by the introduction of some new basis for the estimate. Until, therefore, modern synthetic statistical methods have been applied to the mass of data already existing I would urge that no change should be made in the methods of collecting, compiling or publishing the existing statistics.

(*b*) I would like to suggest the need for carrying out a statistical agricultural survey of every district in India by means of the existing statistics for past years. The material is available in the records of every Province. What is required is that the data for as many years back as possible should be dealt with analytically and synthetically by modern statistical methods so as to make it possible to trace the course of events from year to year and cycle to cycle; and to correlate the various data in such a way as to arrive at their rational interpretation. Such a survey as I have in mind has already been carried out for part of Bengal by a gentleman with whom I am acquainted, who is unfortunately at present in England. This gentleman (who is a very fine mathematician and statistician) devoted several years to this work which he carried out entirely at his own expense. The work he accomplished, which is as yet mostly unpublished, is so extraordinarily valuable that I think the Commission should get into touch with Mr. Bowie, who is the gentleman I refer to, with a view to examining his work. His present address is—J. Bowie, Esq., Avondale Hotel, 1-4, Tavistock Place, Tavistock Square, London.

Oral Evidence

21146. *The Chairman :* Dr. Bentley, you are Director of Public Health in the Presidency of Bengal ?—Yes.

21147. You have provided the Commission with a note of the evidence that you wish to give. Do you want to make any statement in amplification of that at this stage ?—I am very much interested in the question of statistical research because it appears to me it has to be the basis really of all our public health work, and it seems to me, of all biological science. Take the case of public health. Unless we knew what has been happening for a series of years and were able to compare from year to year, we could not tell what we were doing. And it seems to me in regard to agriculture it is essential that the data that exist should be treated with the respect they deserve. We are impressed by the remarkable advance in the work of statistical analysis and appreciation that has taken place in recent years, especially in America, but not in Great Britain. In Great Britain, in fact in Europe generally, there is not nearly the same interest in dealing with statistics as in America. Take the Statistical Economic Institute at Rome, which was originally entirely staffed by Americans and which was initiated by America. We have a great number of excellent specialists in Europe, but in many parts their work has been in a groove. The use of what I call synthetic methods has not yet spread as it should. We do not hear in England about cycles to the extent that one reads of them in American statistical literature. In fact, I know in regard to India the question of rainfall cycles which has cropped from time to time has been in the past jeered at, laughed to scorn ; in fact it has been stated that there is no evidence of rainfall cycles ; and yet it is not a difficult matter to demonstrate the occurrence of such cycles. It is a matter of definition of the term.

21148. Have you any constructive suggestions to make which might have the effect of providing this country with a more efficient department or service for statistical work ?—What I would like to suggest is this, every department in each Province should have at least one trained statistical clerk to begin with.

21149. Where do you suggest he should be trained ?—Statistics is not such an abstruse science. The demand for such clerks would speedily create the supply. Every year our Universities are turning out graduates in economics and mathematics. Any of them, either a graduate in economics or a graduate in mathematics, with a little training, would easily take up the work. For my own department I had to train a clerk, not a graduate, in order to do the simple sort of work that our establishment and our finance enable us to do. I set him on a few days ago to get out figures,—I happened to have the data available in my office,—of the net cropped areas for the last thirty and odd years in every district in Bengal. He is a clerk drawing Rs. 125 a month. These statistics were collected by him. The graph on page 8 of my report shows that the course of events has been in certain very badly affected malarious areas in Bengal ; the net cropped areas in them have fallen by 50 per cent. in thirty years.

21150. Does that mean that there is a close relation between economic conditions and vital statistics ?—Undoubtedly, in Bengal, and, as far as I can see, in all countries depending upon agriculture, there is such a close connection that you can never get away from it.

21151. The Commission has had an opportunity of reading through your interesting note and also the volume entitled "Malaria and Agriculture in Bengal" which has been prepared by you. I wanted in the main, if I may, to take you rather off the lines of your note and to get from you evidence on one or two questions of general importance. I should like first to ask you to give the Commission quite shortly an account of the distribution of your forces in the Presidency ?—You mean the Public Health organisation ?

21152. Yes, the Public Health organisation ?—The Public Health organisation in Bengal now resolves itself into the central organisation and the local. The central organisation consists of myself and a few senior officers. There is a Director of the Public Health Laboratory ; there is an officer who devotes attention specially to malaria ; and there are four other officers at the present time who are engaged in inspection work, generally inspection of the work of local bodies and the inspection of epidemic work.

21153. Are they entitled "Assistant Directors" ?—Yes, "Assistant Directors of Public Health."

21154. There are three of them ?—There are three of them ; a special Malaria Officer ; and a Director of the Public Health Laboratory ; total 5.

21155. Are they of the grade of Assistant Surgeons ?—No. Most of them have British medical qualifications, a British diploma in Public Health ; one of them has a Calcutta diploma in Public Health.

21156. How many Europeans ?—There is one officer in addition to myself, the Director of the Public Health Laboratory, Colonel Stewart.

21157. I think the officer concerned with malaria is a trained malariologist ?—Yes; he was trained in England; he holds a diploma in Tropical Medicine and a diploma in Public Health, and has had long experience.

21158. What is the actual strength of your inspection staff ?—The Assistant Directors of Public Health are the superior inspectorate. Then, I have a small staff of Sub-Assistant Surgeons, at the moment I cannot give you the actual number, because the number has been increased since I had been on leave, I have a small staff of Sub-Assistant Surgeons for epidemic work to be lent to local authorities.

21159. A mobile column for emergency ?—Yes, for *kala-azar* work and for temporary loan for cholera work.

21160. How many Health Officers in addition to these ?—I have no Health Officers. We have them under the local authorities; under District Boards and Municipalities there are Sanitary Inspectors.

21161. Where are they trained ?—They are trained in a class which is held by an officer working under me, a teacher, and my Assistant Directors also take part in the training.

21162. How long does it last ?—A year.

21163. Are you satisfied with the men turned out ?—Yes. At the present moment we have got some of our old vaccination inspecting staff undergoing training; they were brought in from the rural areas to undergo training with a view to utilising their services, more in connection with control of epidemics; and, as I had anticipated, that material is rather defective; many of them can read and write only in the vernacular, they are not very intelligent and their education has been deficient. There are about 60 of these. But the men that are turned out as sanitary inspectors are not at all bad; in fact, they are just as good as the men turned out in Bombay and given a certificate under the Royal Institute from London.

21164. Can you say how many Sanitary Inspectors you have ?—Something over a hundred in the whole Province. I have none myself, but there are over a hundred in the whole Province. Without referring to files I could not tell you the exact number now.

21165. Is it an exact territorial unit each with its Sanitary Inspector ?—We have 120 Municipalities in Bengal, of which the larger ones employ Health Officers of their own and Sanitary Inspectors. A certain number of the very smallest employ nobody whatever, because their income is too small to enable them to meet the cost. That is for the town areas. We have 26 District Boards. All but one of these District Boards have their own Health Officers and employ their own epidemic doctors and a certain number of Sanitary Inspectors.

21166. Those are men trained in the manner you describe ?—Yes.

21167. Are the Health Officers qualified men ?—They hold a diploma in Public Health.

21168. Is this part of Local Self-Government ?—The Local Self-Government organisation ?

21169. Yes ?—Yes, it is.

21170. You have no Public Health Act as such ?—No. I have in season and out of season pointed out the necessity for a Public Health Act, but we are still without it.

21171. What are the grounds that you understand are given for that recommendation not being taken up ?—We had a Bill drafted, and unfortunately that Bill was not passed before the Reformed Council came in. It was never introduced into the Council. There was a meeting of the chairmen and delegates of local authorities to consider the question of this Bill and to consider whether it should be proceeded with. Unfortunately when these local authorities had been addressed in connection with this Bill, emphasis by mistake had been laid on the question of taxation, and they naturally said this was only another Act which would increase taxation and they would have none of it. And consequently when the resolution was put at the meeting that the Bill should be proceeded with, the meeting was in the majority against it. So, there it remains.

21172. What about the attitude of the local authorities towards questions of public health and hygiene ?—The majority of the local authorities now are exceedingly keen.

21173. They are active ?—They are very keen. The difficulty they find is the financial one, because their resources are extraordinarily limited in the rural areas. Our

District Boards, for example, command only an average income per head of the populace they serve, of 4½ annas per annum for all purposes, communications and everything, and that does not leave them a very large sum to spend on public health.

21174. Has there been a marked increase in the interest that local authorities show towards these questions ?—Yes, a very great increase.

21175. Of recent years ?—Yes; ever since they had District Health Officers; ever since they had definite encouragement from Government in the form of grants-in-aid, and if we could extend that encouragement we should have still further advance.

21176. Do these authorities get a fixed grant-in-aid or a percentage ?—I may say I use the term wrongly. The principle of grant-in-aid has not yet been applied in the way in which it has been applied in Great Britain. It is really usually a dole; when Government had the money, something has been given, and when times were bad that help has been withdrawn.

21177. So that no local authority could undertake a fixed annual charge with confidence that Government, year by year, would bear a share ?—That has been one of the great difficulties; half of the salaries of Health Officers and Sanitary Inspectors in Municipalities has been met by Government; that has been the only thing they could count upon. But even there difficulties arise, because when a man goes on leave the Government contribution ceases.

21178. Are Government in this Presidency subsidising practitioners, with a view to persuading them to practise in rural areas ?—I believe there has been a scheme of that sort tried in one or two districts: it has been tried at various times; I do not think it has been very successful. I have been out of the country for nearly 18 months, but I think there is one such scheme in one of the districts; that comes under the Medical Department.

21179. Would you advocate such schemes ?—Yes, if a satisfactory scheme can be devised. The difficulty is in the laying down of conditions. If too hard and fast conditions are laid down, it prevents any scheme being successful.

21180. It requires to be sympathetically administered ?—Yes, very sympathetically; I was listening to Dr. Chatterjee's evidence this morning, and I can say that everything depends upon that. As a Government official, I am tied hand and foot. For instance, there is cholera raging to-day, but I cannot go out and do what I wish; I am tied. In Bengal, to-day, I know very well that I can stamp out cholera at a comparatively small cost, just as the Dutch have done in Java, but before I can get a chance to do that, it would take me eighteen months. Meanwhile, cholera is killing thousands of people practically every week. Their methods are cumbersome, and I could not get the permission in time. I would have to put up a cut and dried scheme, say exactly how I was going to work, what staff I wanted, exactly how much each was going to be paid, including the pay of the chaprasis and peons. Everything would have to be first of all put up in order to get any consideration at all. When that had been considered, it would still have to be gone through again after it had been included in the budget; it would then have to be voted on by the Legislative Council; then, even when the Council had perhaps approved of the scheme and had agreed to the grant, still I could not begin work until I had direct orders from Government, giving me sanction to spend the money. Some years ago, before we have our present system of public health, I remember a Civil Surgeon sent out vaccinators to stamp out an epidemic of small-pox; he did not consult me beforehand, but after the men had done their work, he sent in a bill for allowances; I had to go up to Government to get a grant for that, but when I got the grant I also got with that grant a letter of censure for having incurred the expenditure without the sanction of Government. One takes such things as a matter of course; it is all in the routine work. As Government officials, we have to work to rules, but it gives you an example of the difficulties that a Public Health Department has to face in getting to work in this country.

21181. About Dr. Chatterjee's evidence, to which you listened this morning, are you personally familiar with the working of Dr. Chatterjee's movement ?—I have taken an interest in it for a number of years. Ever since I realised and discovered that societies had been started, and that the members were actually taxing themselves voluntarily even to a small extent, to do sanitary work in their areas, I realised that that was no ordinary movement. At that time, there were only about three societies.

21182. Would you like to see these societies looking more and more to the Local Unions or towards the co-operative movement as such ?—It is a difficult question to reply to; take the question of our Union Boards; the Village Self-Government Act was passed some years ago, but Union Boards do not exist for the great part of the Province now. It has been successful in a few districts, but in many districts it hangs fire, and the Union Boards are still, in a number of areas, regarded with suspicion by the people. So long

as that sort of feeling exists among the people, it is quite impossible that you will have any sort of relationship between non-existing Union Boards and such societies as exist. If the Act could be applied to the whole of the Province, there should be 7,000 to 8,000 Union Boards, but their number now is somewhere in the neighbourhood of 1,500.

21183. *Mr. Gupta :* Where they exist, you have no objection ?—Where they exist, there is no objection, but in this Presidency, unfortunately they exist in a very few districts.

21184. *The Chairman :* You have no strong feeling on the point, probably ?—I may say that back in 1919 and more recently, I have expressed the view officially to Government that the Union Boards as a local authority were doomed to failure, so that I am possibly rather biased.

21185. So that, in your view, the voluntary societies who attach themselves to Union Boards in preference to attaching themselves to the co-operative movement will not be able to achieve much ?—Unless they can do what has been done in one or two cases, where they themselves have captured the Municipality ; they have to capture the Union Boards, and that is what I think Dr. Chatterjee has said. Supposing a society can so far capture the Union Board by seeing that some of its officers are elected, then it will improve the vitality of both, undoubtedly.

21186. *Sir Henry Lawrence :* What is the area of jurisdiction of the Union Boards ?—About 10 to 12 square miles.

21187. How many villages ?—It varies ; on an average there is a village to each square mile, probably rather more.

21188. *The Chairman :* Have you any suggestions to lay before the Royal Commission as to the direction in which the Education Department might forward the interest of public health and hygiene ?—A great deal, undoubtedly, can be done, and is being attempted in fact, by the Education Department ; they have a syllabus on hygiene, and there is some attempt being made, I believe, to teach it. In certain areas, the District Boards and the Municipalities have taken up medical inspection of school children on a small scale, and there has been a certain amount of active work in regard to the prevention of malaria amongst school children, the administration of quinine, and so on. I think probably a good deal more might be attempted, but it is the question of funds that stands in the way ; we have only a limited number of officers and a limited amount of money to spend.

21189. How about the text-books, if there are any, for the teaching of hygiene in elementary schools ?—There are an enormous number of text-books on hygiene.

21190. In the vernacular ?—Yes : their number must now run, I should think, into at least a hundred.

21191. Are they uptodate ?—Some of them are quite good.

21192. Are you satisfied with them, on the whole ?—On the whole, I am satisfied with them ; some of them are excellent ; they are increasing in number from year to year.

21193. How about the training of school teachers in the art of teaching the elementary rules of health ? Are you paying any attention to the normal schools at all ?—We have really not got the staff for that, but some of our officers, on occasions, do give courses of lectures, at the request of the Education Department or some of its officers, in the training schools and so on, but if we really want to take up the matter seriously, we want a very much larger staff than we have at present.

21194. It is very little use teaching school children rules of health, if the sanitary appliances at the school are thoroughly unsatisfactory ; what about the sanitary appliances ?—Many of them are very defective still, even in Calcutta. In many of the rural areas, wherever there is a grant-in-aid in connection with a school, the erection of a school, or the addition of a school building, the plans are submitted to the Director of Public Health for approval and we have been able, by careful scrutiny of those plans and working in harmony with the Education Department, to get considerable improvement made in school buildings that are being erected. But there is a vast number of schools in buildings that were never designed for schools ; they are in dwelling houses and other places in which the conditions of lighting and ventilation and everything of that sort are very defective. In rural areas, where there are no latrines and no proper water-supply, it is practically impossible to do anything.

21195. How about keeping latrines in schools in proper order ; have you any system of inspection ?—We have not got anything like the staff ; there are somewhere about 150,000 schools.

21196. You have a right to inspect wherever Government subsidise ?—We have the right, but we have not got the staff to do it ; we inspect a few now and again.

21197. What do those inspections show ?—I think I can give you some data ; we found a very large number of defectives among the school children. In 1924 we examined 93 schools and 5,741 school children. That was the work done by our own staff of Inspectors, in addition to the work that was done by some of the local authorities. As regards physical condition, 19 per cent of the children were well nourished, 62 per cent in fair condition, 19 per cent ill-nourished ; 39 per cent wore shoes and 60 per cent did not ; 22 per cent were well-dressed, 54 per cent had fair clothing and 24 per cent were poorly clad ; in physical condition, 65 per cent showed defects.

21198. I am concerned, at the moment, with the manner in which the schools were kept ; were the sanitary arrangements clean ?—It is really impossible to say, because the number of schools examined from that point of view was small ; also, they all had previous notice of the inspection.

21199. Do you know how often these health primers are used ?—I cannot say. It is only the Education Department that can give you that information.

21200. When your Inspectors go round to schools, do they ask the children questions on hygiene, elementary rules of health and so on ?—No, because we are almost, I may say, in the way of many of the teachers yet. Our Inspectors are not particularly welcomed ; in some cases they are welcomed. We do interfere to a certain extent with the teaching of the particular day of the inspection and therefore we have to proceed in that work very tactfully so as not to get up, on the one hand, against the teaching staff and, on the other, against the parents. So far, we have, I think, avoided being unpopular. If we had become unpopular, the work would have been shut down entirely. In fact, I may say that only three years ago, just after the work was started, the work itself was threatened by our Retrenchment Committee.

21201. Now, one or two questions about the epidemic diseases. Is hookworm a very important problem in this Presidency ?—Probably 90 per cent of the people suffer from it.

21202. Have you any campaign against hookworm ?—We did start a campaign against it but it was shut down because there were objectors in the Council.

21203. How about the campaign against hookworm in tea plantations in this Presidency ?—They have their own staff. They have European medical officers as well as Indian doctors on each garden and the work is carried out by them. They are not in any way connected with us and they do not submit their reports to us. We can only get the information from them by a special request.

21204. I am sure they are much too wise not to proceed on the lines of careful examination of the problem and a due recording of experiences. Do they put all facts at your disposal ?— When we had our campaign there was a great deal of work done by our officers on the tea gardens with the idea that the work would be continued by their own staff and their own officers. I know that it has been continued not merely there but also in Asansol Mining Settlement, that is, in the coal mining area too.

21205. I suppose the provision of sanitary latrines is the central point in the campaign ?—Undoubtedly.

21206. And then the treatment of infected individuals ?—Yes, the latrine problem is the most difficult.

21207. You have got to design a reasonably cheap latrine, which is hard enough, and then you have got to look after it properly ?—In Jalpaiguri district they have built a septic tank latrine of quite considerable size and they consulted me about it. That was before I went Home. I do not know how it is working now. The tea industry took a great deal of interest in it and there were enough planters and medical officers who were carrying out experiments with various types of latrines in order to get over the difficulty.

21208. What has been the effect on the working efficiency of the labourers by this campaign ?—It has always been admitted that they have got a definite return relating to efficiency. I could not give you exact figures at the present moment as I have not got the recent reports in my office.

21209. We have this volume, which is the report of the Bengal *Kala-azar* Conference Is that disease a very important problem in this Presidency too ?—Indeed, it is a very important disease.

21210. Is it spreading ?—It has undoubtedly been spreading. There are several areas that have been tapped in quite recent times, say, during the last two or three years, I had a great deal to do with the recognition and influence of *kala-azar* years ago. There are

many parts of Bengal which ten or twelve years ago were relatively free from the disease but are now suffering from it extensively.

21211. Has there been a re-infection of Bengal from some outside source ?—I think the disease has been endemic probably for a long time. Of course, it has its own cycle.

21212. *Professor Gangulee :* Have you any knowledge of the mode of infection ?—A good deal of work has been done in research and some evidence seems to indicate that there is one species of sandfly which is responsible for infection.

21213. *The Chairman :* What about *bilharziosis* in men ?—It is practically unknown in Bengal.

21214. Do you get it in cattle ?—I believe there are some species of the worm with us at present but I have not heard very much about it.

21215. How about pthisis ?—That is a very common disease.

21216. Is it extending ?—I think in all probability it is.

21217. Is there surgical tuberculosis ?—Very little, that is to say, as compared with European countries.

21218. Do you attach great importance to the problem of malnutrition in this Presidency ?—In one sense, yes. There is a very large proportion of the population that at certain times of the year or in certain districts does not get enough nourishment at all.

21219. That is starvation. I want to know whether the diet is badly balanced or whether certain essential food-stuffs are absent ?—Badly balanced diet is also universal.

21220. Do they take too much rice ?—They take too little proteids. The milk-supply is very very poor. It is very costly and a large number of people cannot buy milk ; they cannot take sufficient quantity of *ghi* also. Most of the people cannot take even fish and the Bengalees, as a race, do not like *dal*.

21221. How about the proportion of the pulses to rice eaten ?—Many people in Bengal hardly touch them. I know that it is not taken to the same extent that it is taken in the United Provinces and the Central Provinces and elsewhere in India. In Assam I tried to give to the coolies a larger amount of *dal* who came from Chota Nagpur and from some parts of Bankura, but I could not succeed in doing so. They were not accustomed to it and they would not have it.

21222. Is the incidence of beriberi high in the Presidency ?—In Calcutta there has been a good deal of the so-called epidemic dropsy, which, I believe, to be the same as beriberi.

21223. To what do you attribute beriberi ?—I have been inclined to consider it an infective disease. As far as I can see it is not directly associated in many cases with nutrition at all, even with diet deficiency. There are personal friends of mine, wealthy Indians, including wealthy Indian medical men, who themselves have suffered from it. They ascribe it to having got the infection while attending patients. Again, there are many wealthy Marwaris who have suffered from it. It is really very difficult to understand how it can be a deficiency disease when one knows it occurring in people who, as far as one can see, are not in any way taking a deficiency or diseased diet. Besides that it has a seasonal incidence from which it looks as though it is an infective disease.

21224. Can you cite any experiment on which you base your statement ?—There has been a considerable amount of investigatory work and all sorts of theories have been put forward about it. At one time it was ascribed to polished rice. I saw an epidemic of beriberi occurring in Jalpaiguri district in 1907 or 1908 which swept through a tea garden and there were hundreds of cases. For example, there was an Indian doctor and his family who suffered from it. When it spread in the tea garden, there was no Burma rice there ; but when investigations were carried out, the epidemic was ascribed to Burma rice.

21225. It may be that there are two diseases, and that there is failure to distinguish one from the other ?—There may be several.

21226. Would you attach importance to other work which is being carried on in the field of human and animal nutrition ?—Undoubtedly I would.

21227. Would you go so far as to say that the problem of malnutrition in man and beast is of great importance ?—It is one of those things on which we cannot have too much information. It is very difficult to say whether one would place this problem above everything else in importance. But there is no doubt that it is exceedingly important and I do not think we can have as much information on the subject.

Dr. C. A. Bentley.

21228. Have you anything to say about the growth or decline of the population in relation to the food-supply in this Presidency ?—In the rural areas where there has been a decline of population, there has also been a decline in agriculture and my observations go to show that there has been a correlation between the actual outturn of harvests as reported by the Agricultural Department and by district officers for a long series of years in given districts with mortality.

21229. Do you think under present conditions of agriculture and irrigation your population is nearing that point where natural checks to any increase operate ?—The problem varies in different parts of the Presidency. The problem is a wholly different one in Eastern Bengal to that in Western and Central Bengal. The chart here shows the growth of population in the different districts of the Presidency. Places where the population is still increasing most rapidly are the places where the line has increased most rapidly in the past. So, there is no question of the population having reached the asymptotic level yet. I saw a reference made to this matter in Madras; it was reported in the papers. I may say that I totally disagree with the evidence that was given upon this very question in Madras by the Director of Public Health.

21230. Are you familiar with the conditions of Madras ?—What I mean to say is that I disagree with his general statement.

21231. You have, of course, I take it, got to accept the fact that there is such a thing as an asymptotic line, which, when you approach it, is a danger signal ?—The point to be borne in mind in this connection is that it has been reached by countries in which there is no question of plentiful food-supply. For instance, in countries like France it has been reached. It has, as far as I can see, nothing whatsoever to do with food-supply. The Director of Public Health in Madras urged, he might have been wrongly reported, that no attempt should be made to increase the food-supply of the population because there was a danger that the population would still go on increasing.

21232. You should see the evidence that was given and not the evidence as it was reported. On the point that you mentioned comparing France with this country, of course the standard of living makes all the difference ?—Undoubtedly. We have had evidence, I think, of an increasing standard of comfort as regards Eastern Bengal for example, because in the last 25 years there has been a 30 per cent. decline in the birth rate in the most prosperous areas.

21233. There are two checks, the point where life can no longer be maintained and the point in the standard of living below which the population refuses to drop. If they hold to that with sufficient insistence, the effect of that is shown in the birth rate ?—Yes. In Eastern Bengal, the birth rate is declining as the result of prosperity; on the other hand, in Western and Central Bengal, the population is declining owing to adversity.

21234. Do you think that in the district where the birth rate is declining owing to greater prosperity there is deliberate control ?—No, I think it is purely biological. Since I returned from leave eighteen months ago there has been the beginning of a campaign by the educated classes in favour of birth control. That is in Calcutta; it has not reached the mass of the population.

21235. You think a higher standard of thinking and living tends in some degree to limit fecundity ?—Undoubtedly.

21236. *Dr. Hyder:* Is the evidence on this point accepted as conclusive by scientists ?—It has never been looked at.

21237. But is the evidence in regard to diminution in fecundity as a result of prosperity regarded as conclusive by scientists ? Do scientists accept it ?—No, there are numbers who do not. You have only to study the reports of the Birth Commission to see that as soon as some facts were put forward quite a number of men refused even to look at them. We know very well in our own experience that there is a very large amount of limited fertility among the highly educated classes and those who are in what may be called a prosperous condition, whereas there is no want of children among the poor.

21238. *The Chairman:* With regard to irrigation in relation to public health problems in the Presidency, you are in favour of further irrigation where possible ?—I say it is *the* big thing in Bengal. We are almost powerless without it, because agriculture is the mainstay of Bengal and the agriculture of a very large portion of Bengal has seriously declined owing to reduced water-supply. The agriculture of the only prosperous areas is entirely dependent on natural and semi-natural irrigation (there is a good deal still of almost accidentally organised irrigation) and that is being to some extent interfered with. We have signs that in Eastern Bengal, which is the most prosperous area, agriculture is not as prosperous now as it was some years ago. There is already in certain districts there a decline in the net crop area.

21239. Would you agree that a larger consumption of milk and milk products by the local population would make a great contribution towards their health and resistance to disease ?—Undoubtedly.

21240. If that is to be obtained, it will be necessary to provide more fodder ?—Undoubtedly.

21241. And without irrigation how can further fodder be provided ?—It cannot be.

21242. One or two questions about village conditions. You have mentioned water-supply, and I observe from your note that in some cases in this Presidency very satisfactory results have been obtained by sinking tube wells ?—Yes.

21243. Does that give a satisfactory water-supply from the public health angle ?—In the majority of cases.

21244. Not always ?—No; sometimes the tube wells give unsuitable water.

21245. Saline ?—Yes, and sometimes bacteriologically unsound.

21246. How do you account for that ?—I have not been able to have the question investigated, because it is the exception for this to be so, but since I came back from England I have heard that some wells which gave pure water when they were sunk two or three years ago have since started to give impure water.

21247. Does not that look like infection ?—I have not carefully investigated a case of that sort, but it looks to me as though it might easily be due to percolation down the outside of the tube, or something of that sort, or something to do with the pump. It may be merely accidental. Only yesterday I had a report of that sort submitted to me.

21248. Broadly speaking, it must be true that the deeper you go for water the more apt you are to get pure drinking water ?—Undoubtedly.

21249. Do you attach great importance to an improved water-supply in relation to health ?—It is of very great importance; it is only second in importance to the supply of more water, and in many cases you cannot have even sufficient pure water unless you have sufficient water of some sort.

21250. Have you ever put forward a considered proposal for the improvement of village water supplies on a large scale ?—We have a scheme in operation now; small grants are being made to District Boards for the purpose of giving grants to Union Boards for wells, tanks and that sort of thing.

21251. Is that under a special Act ?—No, it is simply a grant given by Government; it is one of the doles Government give. They find they can spend a couple of lakhs on this for one year, but we are not certain it can be continued.

21252. Is there any indication that public opinion is moving in this matter ?—There is a tremendous demand for something to be done in this way.

21253. From the rural population ?—Yes, from everybody. The great difficulty is money. Government have only got Rs. 2 per head of the population for all purposes.

21254. Have you ever attempted to measure the relief which a better water-supply, by giving better health, might mean to the State in the direction of lower charges for curing disease, maintaining indigent persons and so on ?—We have no data for that; nothing is done towards supporting the poor except by voluntary effort. We have nothing like the Poor Law Act or anything of that sort. The only sort of relief which is given is medical attendance and medicines, and even that is given only on a small scale, relatively, and only touches the fringe of the population. We have therefore no data to go on.

21255. Is it possible to express in money the charge on public revenues as a result of water-borne epidemic disease ?—No, because with the public revenues which we get it would be impossible to show that. Whatever we were to spend on that would come from the public revenues, but there would be no chance of getting added revenues back.

21256. That is the difficulty of financing a scheme of that sort ?—It is. Those of our municipalities which have extended their water-supply are of course taxing themselves, but they can only construct these schemes by means of large grants from Government.

21257. Have you any cases of village supplies derived from wells being pumped up into gravity tanks ?—Yes, there are one or two schemes of that sort.

21258. Have you any instances of windmills being used to pump up the water ?—Not by any local authority, nor so far as I am aware in any scheme Government have in hand.

21259. Do you happen to know whether a wind survey has ever been carried out here ?—I do not think it has. I have seen windmills installed here and there by private persons, but I do not know if they are successful.

21260. Is there sufficient breeze here to work a mill during many days of the years ?—Near the banks of some of the rivers there is a fairly constant breeze, but I could not say whether it exists all the year round.

21261. With regard to dwelling houses in the rural hamlets, have you anything to say about the possibility of improving those houses ? I take it it is no use asking the countrymen to change their practice of building altogether, but within the limits the rural population would accept ?—Taking Eastern Bengal, for example, I do not think much can be said in criticism against the house in which the reasonably well-off cultivator lives. It consists of several huts provided with verandahs raised on very high plinths; the walls are made of bamboo, and the building is sometimes covered with corrugated iron, which I do not think is as good as thatch but which is cheaper. A prosperous village is really a pleasant sight, and I do not think there is much that can be objected to in that type of house. It is different from the mud house which is sometimes used in Western Bengal, and that is a danger, especially when we get near Bihar, where there is plague. It is not such a good type of house as we have in Eastern Bengal.

21262. Is a corrugated roof really cheaper than thatch ?—Yes, because it lasts.

21263. Are the floors of dwellings raised off the ground on piles ?—No, on a high earth plinth.

21264. Is that better than piles ?—I do not say it is better, but you could not get the timber for piles. In the densely populated areas, timber is a very great difficulty, and bamboo has to be used.

21265. A word more about the milk-supply. What about the urban milk-supply in Calcutta ? Are there local rules drawn up for that ? Does the Municipality control the milk-supply ?—Yes, they have considerable powers under the Calcutta Municipal Act.

21266. Are those powers used ?—Yes, they are used fairly well.

21267. Is an inspection of the milk offered for sale in public places carried out ?—Yes. You cannot compare our standard of inspection here with what you will find in London or Huddersfield or any other English town, but on the whole it is not badly done and it has been very much improved in recent years.

21268. Is Calcutta the only city in the Presidency where milk inspection is carried on ?—No, but there is not very much that can be done at the present time in the way of milk inspection. Wherever there is a Health Officer and a Sanitary Inspector, a certain amount of work of that sort is being done. The chief difficulty met with is the fact that the supplies of milk are so scanty that there is a temptation, I believe, for the officers not to be too drastic in their inspection, as otherwise they would reduce the supplies of milk available and raise the price. The price of milk is very high in Bengal, especially in the mofussil towns.

21269. *Sir Henry Lawrence*: What is the price of milk in rural areas ?—It was reported to me the other day that in Jessore town it was even as high as Re. 1 a seer, 12 annas a seer. I know that in many places you cann ot get 3 seers for less than a rupee, and 2 seers for a rupee is a fair price now.

21270. For a *pucca* seer of 2 lbs. ?—Yes.

21271. Can the ryot afford to pay that ?—There is hardly anyone in Bengal who can afford to pay it, except the wealthy and people who say they must have milk.

21272. So that in fact milk is unobtainable as a diet except among very few ?—A very large number cannot afford it. I know the other day I had to report on a school where one of my officers had gone and inspected the school hostel. He went into this question of diet and found that there were one or two boys who were taking a pound of milk a day; a very large proportion of them took no milk whatsoever, the reason being they could not afford it.

21273. And for people who live on rice, you consider that milk is a particularly valuable addition to their diet ?—Undoubtedly milk is essential, milk and *ghi*.

21274. As to these experiments regarding malnutrition which the Chairman has asked you about, would you require such experiments to be conducted in every Province or would you accept the result of experiments made, say, in Madras as applying to Bengal ?—It would be much better to have experiments carried out in each Province,

because conditions vary. Taking the question of rice alone there are so many varieties. I could not name them; I know it runs into an enormous number.

21275. And their nutritive value is different ?—In all probability.

21276. Do you accept the view (stated to us in Madras) that large numbers of people eat so much rice that it is indigestible and that with this margin of money which they now spend on the additional rice they could buy other more nutritious and valuable food ?—I think probably that is quite sound, yes. But they are accustomed to it, and it is very difficult to get a man who has been accustomed from his boyhood to feed in a certain way to change his habits.

21277. Then I understand from your note that there has been some falling off in the consumption of fish; the area from which fish has been obtained has been decreased ?—I do not know that there is any exact data showing the decline; but we know that very well in the reports of the late Sir Krishna Gupta and K. C. De; they enquired into the question of fish supplies in the Presidency of Bengal and came to the conclusion that there was a great diminution in the supply and that the price of fish had gone up. It is very difficult to purchase fish now at a reasonable figure. Supplies of fish are much reduced from what they were formerly, even within my own experience.

21278. Is that due to the drying up of tanks ?—Yes; the majority of the tanks now will not hold water throughout the year and there are enormous numbers of tanks which from the point of view of fish are of very little use now; formerly they must have contained innumerable fish.

21279. On which department rests the duty of looking after these tanks ?—On none. Most of these tanks belong, under our settlement system here, to private owners. There is no department responsible unless they happen to be used for a public drinking water-supply. There is no local authority that will do anything for them and it rests with the individual co-sharers or co-owners and if they have not the will or the means to do it nothing is done.

21280. Do you consider that in the public interest some measures should be taken to enforce the improvement of these tanks ?—It is no use enforcing an improvement of the existing tanks. Take, for example, the Burdwan district. Unless the supply of water is increased it will only waste money; the delta areas both in Burdwan and in the Presidency Division have been deprived of so much water that that has been, in my opinion, the main cause of these tanks going out of use. The first need is a larger supply of water. Then, once you get that, automatically you would get the improvement of a number of these tanks.

21281. By the zamindars themselves ?—The people, these co-sharers, would find at once that if they find water they would find fish. Now it is known very well that an acre of water is more profitable than an acre of land; but you cannot get water; that is the difficulty.

21282. You have no suggestions to make for public action through Government or any agency authorised by Government by legislative power to improve these tanks ?—I would urge the taking up of a comprehensive policy of irrigation in order, among other things, to increase the supply of subsoil water and to provide the increased supply of surface water to feed the tanks which at the present time are waterless or are silted up, with a view to improving both agriculture and public health by reducing malaria and also reducing water-borne diseases.

21283. But you do not recommend any interference by legislative power with the tanks themselves ?—Not unless there are arrangements for a fresh supply of water. Perhaps I am not quite grasping your question. There are great difficulties at the present time. Supposing a man or even a local authority wants to construct a tank there are difficulties in getting a site to excavate a tank. I certainly think that there should be legislative powers in order to simplify the acquisition of tanks for improvement; but as regards the general policy I say nothing should be done on a large scale unless the water-supply is increased.

21284. For the construction of a tank, is there not already legislative power under the Land Acquisition Act ?—Yes; but then that does not help individuals and also there have been difficulties, even local authorities have found difficulty, in making use of it. The question of the actual ownership of tanks is a very difficult one in Bengal.

21285. And you have no definite proposal to make as regards any legislative powers ?—I certainly would support legislation to simplify the existing procedure and make it possible, for example, for those who wish to improve tanks; say if there is one co-sharer of a tank who wishes to improve it, at the present moment even though the other co-sharers have not money to improve it themselves, they can prevent him doing it and not frequently

fellows of this sort do prevent the improvement of the existing tanks. Obviously insanitary tanks are a danger not merely to the owners but also to others in the neighbourhood and there should be some means of enabling the existing tanks to be improved if there is somebody willing to do it, whether it be a local authority or whether it be a private person.

21286. Have any proposals to this effect been discussed by Government at all ?—The Government have considered the whole question of water-supply policy for years. We have got file after file dealing with this problem ; but they have never come to any conclusion, mainly, I think, because every proposal has involved enormous expense and they did not know where to find the money. But as regards this question of legislation, that has not been taken up by itself. It might be with advantage, I think.

21287. Are you prepared to put up proposals to that effect in your department ?—Yes ; I think I am prepared. I will be prepared to go into the question and make, I would say, first of all suggestions, because there are a whole lot of other people who have to be consulted. It would be no use my making proposals unless others have been consulted. I can make suggestions and can open the question.

21288. The ball has been there for 20 or 30 years and it will be just as well to start it rolling soon ?—This ball has been rolling about Bengal for the last 25 years at least ; but it does nothing but roll. I think Mr. Gupta knows that and this question of water-supply is one which has worried Government and also local authorities for years. We are also faced with the question of money. I can easily supply copies of the note that I submitted years ago to Government on this very subject to the Commission if it would be of any use to them.

21289. You attach considerable importance to irrigation. The Chief Engineer of Irrigation a day or two ago seemed to think that there was much prospect for irrigation. Have you ever discussed the question with him ?—I have discussed it frequently with officers of the Public Works Department. I am quite aware of their ideas.

21290. Do they coincide with yours ?—They do not, because I do not think they have considered the question except from their own point of view. All our departments are tied in this question by past traditions and it is very difficult for the head of the department to come forward and say, "The policy that our department has been following for so many years has been a wrong one and we have got to reverse it." That is what it actually would amount to in Bengal, because certainly ever since the late Lord Curzon's pronouncement on irrigation most of the people who had any voice in the matter have wiped out Bengal as not requiring irrigation at all and consequently the Public Works Department have paid no attention to it.

21291. Then you consider that the condition of certain parts of the Presidency deteriorated owing to the embankments on certain rivers, the Damodar river, for instance ?—I find the decay of many of the rivers has followed that and certainly many of the rivers themselves have suffered by that. All engineers, I think, are entirely agreed upon that. It is an admitted thing.

21292. Do you advocate the removal of these embankments now ?—No ; I advocate the introduction of irrigation systems. Really I would say this, to use the words of the late Colonel Baird Smith, one of the greatest irrigation experts of India, while discussing the very question of irrigation and flood control of the Mahanadi many years ago. He said it is necessary to harness a river in order to prevent its doing damage ; but, he said, if you harness it and do not employ its waters it will sooner or later break loose and destroy. He likened it to a horse and he said you must not harness a horse and tie it ; harness a horse and work it ; so also harness a river and utilise its water and the first thing you must do when you are going to irrigate from a river is you must embank it ; that was done in the Nile ; but he said it is fatal to leave those waters unutilised.

21293. You spoke of your budget having been one-eighth of the total expenditure of the Province ; that is medical and public health expenditure ?—No. The Medical Department is quite separate from the Public Health Department.

21294. The Public Health budget, I understand, is about 38 lakhs ?—As a matter of fact it includes a lot of things which I should not call public health. Our real budget is very much smaller than that. A few years ago the allotment for certain other heads were put under the heading "Public Health." I do not know what those are, and I do not know how they spend. But the amount which my own department is concerned with is very small.

21295. *Rai Bahadur Bannerji :* What was it last year ?—I could not tell you what the last two budgets were, because I had been away. But it is only one-fourth of the sum referred to just now. It is about 9 lakhs ; it may be a little bit more because we have had large grants for *kala-azar* while I have been on leave ; it might be 12 lakhs now.

21296. *Sir Henry Lawrence :* Taking these figures from the printed budget, the expenditure comes to 60 lakhs for Medical and 40 lakhs for Public Health. Do you regard that as proper application of public money ? Would you like to see public health recognised more and more than medical ?—I suppose we all think our own departments most important. I think myself that Public Health is really more important than Medical, the prevention of disease is more important than the treatment of disease. I think so, but there are probably still others who think differently.

21297. Could you put that into figures ? Do you consider that Public Health ought to have nine-tenths and Medical one-tenth ?—Personally, I should not complain if I had for the Public Health Department as much as the Medical Department. With that we would be better off than we ever dreamed of.

21298. An increase of 50 per cent. in your budget would satisfy you ?—I do not say it would satisfy me ; I say we shall be better off than we ever dreamed of. It is one of those things in which I would not like to rob Peter to pay Paul ; because we are treated so badly by the financial settlement. Of every 6 or 8 rupees of revenue raised in Bengal only 2 rupees remain in the Province, and it does not give us a fair chance. I am speaking in this way for all departments and not merely for my own.

21299. *Sir Thomas Middleton :* You say that investigations into questions of nutrition should be carried on in each Province ?—I would like to see it carried on in each Province.

21300. Would you agree that in any case dietary studies should be conducted in each Province ?—Yes ; I certainly think so.

21301. Has any one continued the work of Colonel McCay ?—That I cannot say at the present moment. For a time at least there was some work done, but exactly on what scale I do not know. The Professor of Physiology was carrying out further work, but I do not think it was anything on the same scale.

21302. No important work has been done since ?—I should not like to say that. There has been some important work done by the School of Tropical Medicine by Major Acton and by Major Chopra. I think they have done some very useful work recently on dietetics and nutrition.

21303. You may remember that Colonel McCay came to the conclusion that the Bengal diet is ill-balanced. Whereas the ordinary diet of the working Bengali was taken by him as being 24 ounces of rice and 1 or 2 ounces of dal, he recommended 18 ounces of rice and 6 ounces of dal. That is his view. Has that view been generally accepted by the medical profession ?—I think the medical profession were too busy about their own affairs to bother their head about it.

21304. *Professor Gangulee :* Colonel McCay's work was confined to the jail population ?—His conclusions I think myself are perfectly sound, but they do not apply to a very large proportion of the people of Bengal because they do not get anything like the amount of that rice to eat.

21305. *Sir Thomas Middleton :* They do not get that amount ?—No.

21306. If his conclusions were sound, that the diet was ill-balanced, is it not a most important thing for the public health of the community that steps should be taken to correct the ill-balanced diet ?—This is a thing in which I myself am very keen ; I would like to see it. But I should first like to see them get sufficient food. I think that is of even more importance than the question of balancing the diet. That is really our problem in Bengal. I have known cultivators when I was investigating malaria in villages, and I have myself found villagers, who at certain times of the year had practically nothing but the produce of their fruit trees ; that is the diet they have until the rice comes up again.

21307. That would apply only to 10 per cent. of the population ?—No ; very much more than that. It depends upon the districts ; it varies according to the districts, because the economic condition of the different districts varies. For instance, in certain areas of the Birbhum district, a very large proportion of the population do not have enough to eat, although it has not been considered bad enough to call it a famine. Only a couple of years ago I visited villages in the Birbhum district in which the bulk of the people had not enough food. I went in connection with cholera, but I found that the people were starving.

21308. That is quite likely. But taking the normal position, whereas your statement would refer, one would hope, only to a small percentage, Colonel McCay's conclusion that the general diet is ill-balanced must refer to something like 90 per cent. of the population ? —It applies equally to the European population, because I think the Europeans are almost

the worst sinners with regard to ill-balanced diet. Speaking of the Europeans in India they take a great amount of proteins, for example.

21309. That may be. Does not the Bengali diet consist of an excess of rice ?—It is a case in which a medical man may be quite convinced of the importance of a balanced diet, but it is quite probable that one does not get a balanced diet oneself when one gets down to it.

21310. You are convinced as a medical man that, generally speaking, it is true that the dietary of a Bengali is badly balanced ?—Yes.

21311. Could you not adopt the same methods of propaganda as you do in connection with your malarial work ?—We have done so, but we have not emphasised it so much, because it is really not so obvious. If we were to start emphasising the question of diet at the present time, in the beginning we should be looked upon by the bulk of the people as mad men. They will say " Why do you not turn your attention to malaria instead of to ill-balanced diet which we do not believe in ?" That is the real difficulty. I have got a considerable amount of literature; in every one of our exhibitions we always have this question dealt with; we have exhibits and we have charts drawn up for this very purpose. But the question of pure food creates far greater interest at the present moment among even educated Indians in Bengal than the question of a balanced diet. I quite agree that it is important, but as a matter of policy we cannot even give the emphasis which its importance deserves because that would damage our other work.

21312. So that while you have figures which enable you to say that every day 1,000 Bengalis die of malaria, you have no figures which would enable you to indicate whether 1,000 or 10,000 die because they live on ill-balanced rations ?—No. The difficulty is this, whereas every Bengali who reads our statistics that on an average so many Bengalis die of malaria, believes it, if we put up that so many Bengalis die of an ill-balanced diet, he would say " What in the world are you talking about ?"

21313. Because you have not facts ?—Not merely that. They have not yet reached the stage in which they can appreciate the thing. We may tell them the facts, but they would not believe it.

21314. It is a matter of education and propaganda ?—Yes; we want education in our schools; this is a matter which should be taken up.

21315. Coming to another subject, you refer to the work that has been done by Mr. Bowie. What is the character of his statistical work ?—He was originally an engineer. Some years ago he was employed by a firm which was dealing with steel, railway material and that sort of thing. He got interested in the theoretical side of his business, and he set himself to discover all the statistical information in regard to the steel and iron trade in India from the point of view of his business, including the question of supply and demand. That made him gather together an enormous amount of data, and dealing with them he discovered that he could not understand the fluctuations in demand for iron and steel products in India. This demand fluctuated from time to time and he found that he must discover why it fluctuated. That led him on to look to agriculture, because he found there was correlation between the two. His business was concerned with Bengal, and therefore he turned to the most important agricultural industry in Bengal, jute, and he set himself to work out all the available data he could find that had any bearing whatsoever on jute, the cultivation of the crop, the areas, the yield and also the jute mill industry. Unfortunately he was not able to attend to the end of his work and publish his figures, but he has got an immense amount of most valuable data, and, what is more, he has dealt with it in a very highly scientific manner.

21316. His work was on jute ?—Yes.

21317. You have told us that you yourself have used the statistics of the Agricultural Department. Have you found these statistics satisfactory for your purpose ?—I do not say that they are more satisfactory than my own statistics, but they are of very great value; I may say that they are not by any means accurate. But my own are also not accurate. In the chart where you have rice harvests compared with mortality over a long series of years, you get such a strong correlation that is very obvious there, and the statistics are collected in the same area by the same agency. It is quite certain that the statistics are of value.

21318. In working with them, you are generally satisfied that they provide you with a kind of information which it would be worth while using a great deal more ?—Undoubtedly.

21319. You use your own medical statistics extensively, but you indicated just now that you are not satisfied with your own statistics ?—Yes.

21320. I want to take an example of your statistics; deaths from pneumonia per 1,000 for example: we get in Calcutta 3·61 per 1,000 and in Naokhali 1 in 10,000. To what extent is that a genuine figure, and to what extent is it due to errors in diagnosis ?—In the one case, in Calcutta, the deaths are reported by a certified medical man, or else,

each death which has not been so reported is enquired into by a medical man, who is employed for that special purpose; whereas in Naokhali the deaths are reported by the village *chowkidar*.

21321. So that, in Calcutta the figures are satisfactory, and the Naokhali figures are in no way comparable with the Calcutta figures ?—Not for causes of death.

21322. You make a very interesting case for the point that Sir Henry Lawrence referred to, the effect of irrigation on production; but in connection with that you make a statement which at any rate I was surprised to read. You say that with adequate irrigation facilities Bengal could feed the whole of India. How do you get at that conclusion ?—By taking the cultivable rice area and the yield per acre. I should refer you, in this connection, to the paper by Dr. Butler, late of the Agricultural Department of India; he used to be at Pusa, and he has published a paper called "Rice Culture in Spain." Dr. Butler attended a conference in Europe on this question, and in his paper he gave the data, including the data for rice production per acre in Spain and in a certain number of other countries.

21323. I had heard the production in Spain referred to, but I could not discover the "original sinner" who made the estimate for India ?—Supposing the existing rice fields of Bengal gave an average yield of rice according to the figure quoted by Dr. Butler for Spain, then the amount of rice produced would feed something like 365 millions.

21324. I was so much puzzled by the Spanish figures that I have looked up the statistics, and this is the position; in Spain there is a very small area under rice: rice accounts for something like ·6 per cent. of the total area under cereals, but in Bengal rice accounts for something like 98 per cent. of the area. It is well known that if you get a very small area in a particular country under a particular crop, you may get a very heavy yield, but it does not follow from that that if the area were expanded so as to cover the whole cultivable land of the country you could get anything like the same heavy yield ?—I am aware of it, and that is why I gave figures for Japan. I stated it in the way in which I did, because I wished to direct attention to it. We are suffering so badly in Bengal for lack of the water necessary for the cultivation of rice, that it is necessary that attention should be directed to it. Here comes the case for special pleading by making a dramatic statement. I am perfectly aware that that figure can be explained in the way that you have suggested. But, on the other hand, the one for Japan is a much more moderate figure, and that is one which is rather difficult to get over, because your criticism applies equally to Japan.

21325. I have not tested the Japan figure, but I am very familiar with the estimates of the "Spanish type." You pleaded so strongly for the better use of statistics that I could not help taking up this example ?—This is an example of statistics being used for special pleading; I admit that.

21326. My point on that is that your case for irrigation is a very strong one, and it would have been strengthened if we merely had the suggestion that one might double the outturn of rice in Bengal ?—I have merely stated that if the rice fields gave the yield of Japan, they would feed 200 million people, because I wish people to look into the subject; they are not aware of the fact.

21327. You have now got on to Japan, and I do not know the position there ?—I say the people are not aware of the fact; in Spain it is reported that you can get 5,500 lbs. of rice per acre.

21328. *Sir Henry Lawrence:* What is the outturn per acre in Japan ?—It is about 2,000 to 2,500 lbs.

21329. *Sir Thomas Middleton:* The Spanish figure is an astonishing one; it probably represents two crops a year on the same land ?—There are similar figures for Egypt too; it is 2,000 lbs.

21330. *Dr. Hyder:* With regard to this matter of statistics, to which you have referred so expressively, I want to ask you a few preliminary questions on matters that have so far cropped up. The first thing is about the population of Bengal infected with malaria. You say that the population of Bengal infected with malaria is 33 millions ?—Of course, that is a very rough estimate.

21331. I was going to ask you how you have arrived at this figure ?—I arrived at it by taking the proportion in a very large number of the dispensaries; I took the proportion of the total admissions for malaria and its ratio to the total admissions, and also by getting the figures in jails and so on, where one can get a fixed population, and can know the incidence of malaria. In a malarious area we can get some sort of a guide. For nearly eleven years I was medical officer in a tea garden estate, and I had then from 12,000 to 25,000 coolies under my charge, with a number of Indian doctors as assistants; there I had a fixed population, and I had a record of the cases treated. I know what the incidence

of malaria can be in association with a given spleen index. We have not got complete figures, but we have a very large number of figures for different parts of Bengal, and I think I am well within the mark when I say that in certain areas practically every person suffers from malaria once in the year; many of them suffer many times over; there are certain districts in which it is the exception not to find a person who has suffered in the year from even a mild attack of malaria. It is the case even among Europeans there.

21332. With regard to this decline of population in Western Bengal, I ask you whether you have sufficient data over a series of years, to get at the proper causes of this decline, if it does exist?—There is the decline; we have got evidence for it over a number of years; the census figures show a definite decline, and I myself got them out for a number of *thanas*.

21333. Was not this decline in the population of Western Bengal chiefly due to the influenza epidemic, according to the figures given in this report?—No, the decline has been going on.

21334. Has this decline been continuous?—In my book I have given a whole series of curves showing in the form of graphs the results of each census since 1872, and I have worked out the figures for the *thanas* on the same lines. In the case of the bad districts, the decline in certain *thanas* has been absolutely continuous.

21335. Since when has jute become a commercial crop in Bengal? Could you give me the date?—I cannot give you the date, but I know it has been so for many years; but I could not say exactly without reference.

21336. Because, you say there is a rain cycle; how far are the records of the Government of India Meteorological Department available?—There are some records available for 70 or 80 years.

21337. Does jute go back to 70 or 80 years also?—Not on a commercial scale, but on a small scale; it has been gradually increasing, and I take it it is about thirty years since it has really become the important thing it is now.

21338. I quite agree with you that great caution must be shown in eliciting any meaning from any set of figures, but the only point that I had in my mind when I asked you this question was this, whether you have sufficient data over a series of years to associate the economic decline with this question of irrigation in Bengal?—Undoubtedly. You can get a correlation because you can work out your error. It is a matter for association. You measure the association of certain factors when you have got a series of figures extending over thirty years as is shown in the graph here. Here is a definite association and it is so obvious that anybody can see it. It is impossible to avoid the idea that there is an association there.

21339. *The Chairman:* Just tell us where is this diagram?—It is opposite to page 58 of my book on "Malaria and Agriculture in Bengal." *

21340. *Dr. Hyder:* You say in your report that the system of distribution of quinine through the post offices has been a failure. The quinine has not gone to the malaria-infected population but that it has been collared by the sharp section of the population for their own benefit?—It has been a failure in so far as it has not reached a very large proportion of the population. It has not been a failure in one way only. What I would like to see is that the use of the quinine should be extended far more. I have told the Government again and again that the question of the supply of quinine has never been placed on a business footing. I maintain that we ought to sell much more quinine in Bengal.

21341. You can have cinchona plantations here?—The existing plantations are very small. The matter has been gone into again. It was also investigated by Colonel Gage. The amount of available land suitable for growing the species of cinchona that would produce quinine is scanty. On the other hand, there is a species of cinchona from which cinchona can be produced which is practically as good as quinine. That grows on a lower elevation and matures more rapidly. So, I have suggested that the matter should be taken up again from that point of view, namely, from the point of view of extending the cultivation of that particular plant, because it is much better to have cinchona and have a large supply of it than to have neither cinchona nor quinine.

21342. With regard to this question of irrigation which is at the root of all problems in Bengal, could you please tell what you are going to do with water after October?—If you can get sufficient water on the land surface in the higher lands, then it will very largely settle itself because your drainage channels have been obstructed owing to the fact that your higher lands have not been getting enough water and also your subsoil level is right down, so that you have not got the constant flow throughout the soil which you should have.

* Bengal Government Press, Calcutta, 1925.

21343. *Mr. Gupta :* You will also grow your *rabi* crop ?—Yes.

21344. And you would also grow new fodder crops ?—Yes, we are helpless without them.

21345. *Dr. Hyder :* So you will have to lift up the water to your higher lands ?—You might in some cases ; but, in the case of the Burdwan Division, the Damodar river is shut out from the country at a height many feet above the level of the country. So also in the flood season in Murshidabad and in Nadia district the Ganges is shut out from the country at a level above the country. I have done my best to get experiments tried. Siphons might be employed for the purpose of experiments or the sluices which exist might be opened. As far as I am aware, those sluices have not been opened and certainly no siphons have been tried.

21346. Comparing the cost of the quinine method, the method of eradication and the method of irrigation, do you think the method of irrigation will turn out to be the cheapest in the end ?—The difficulty is that we have not got the money to carry out the other methods on the scale needed. If Bengal could have irrigation, the people would soon get the money which will enable them to put into practice specific measures of malaria control on a scale which is adequate.

21347. *Mr. Gupta :* How does your Province compare with other Provinces in India in the matter of health and the importance of your department ? Would you consider Bengal as favourably situated in the matter of health, or is it a really very unhealthy Province ?—It is unhealthy. During the last few years, I may say, in the matter of birth rate our Province has been at its lowest. It has not been quite at the top of the list as regards death rate recently, but it is always fairly high up.

21348. As far as the death rate and birth rate is concerned, is the health of the Presidency getting better or is it declining ?—There has not been any great sign of improvement. It remains more or less the same. There has been a reduction of mortality in the last few years, but I think that is the reaction from the immense mortality of the influenza era.

21349. Judging from the standard of other Provinces in India and of other countries, do you not think the Health Department is one of the most important departments of the administration of this Province ?—It should be, but it is not. It is one of the minor departments.

21350. That is quite wrong in your opinion, is it not ?—I certainly think that the Health Department should have the same standing as, say, the Ministry of Health in Great Britain.

21351. I entirely agree with your views. I am only trying to recapitulate your views on this matter. You also hold that there is not much in the argument that if you try and improve health and if you try and improve wealth, the population of the country will go up and it will not be able to keep pace with the supply of the country and therefore from that point of view it will be creating fresh difficulties. Do you think there is any substance in that argument ?—That is one of the arguments which has constantly been put up to me, especially during the past few years. It has been discussed usually more or less in private when one has been discussing it with educated people. The question is whether public health efforts were justified or not and whether they were really necessary. It has again and again been said that if you prevent the people from dying, the country will be over-populated. But that is wrong. If you increase prosperity and raise the standard of living, the population will finally cease to expand.

21352. In the Rotary Club last year that point was urged and obviously there was nobody to contradict it ?—I wish I had been there to contradict it.

21353. Regarding your staff, do you not think that your greatest trouble is that you have not got any staff to cope with the rural areas of the district and that under the health officers of the District Boards the only staff is a few vaccination officers ?—That is one of the greatest troubles. If we had a sufficient staff, which would only cost practically a farthing per head of the population, we could wipe out cholera within three years.

21354. What has happened to the scheme of Government in which it was proposed to have a health officer in each *thana* and an offer was made to the District Boards that Government would find money for the recurring cost of the maintenance of this health officer as long as they agreed to find the subordinate staff and also paid for the medicine ?—That scheme is, I believe, still under consideration. In fact, I have the file with me in my office.

21355. It is a most important matter and I hope that it is going to receive the attention that it deserves ?—Yes.

21356. Regarding Government contribution, may I ask you whether it is not the fact that quite recently Government have made over the public works cess to District Boards and have earmarked it for sanitation and water-supply ?—It is a very small sum.

21357. Besides this subvention, Government are also giving grants for combating diseases like malaria and *kala-azar* ?—We have had a grant but it is very little for Bengal. The Government of Assam have been spending, I think, about 3 lakhs on *kala-azar* and we are spending about 2 lakhs and we are seven times as big.

21358. But we are beginning to move ?—Yes.

21359. I quite agree with you that, notwithstanding the money that the District Boards have got from the public works cess and the small grants that Government have made, there is a need for great financial resources. Would you be in favour of a small sanitary tax ? Do you not think that without some further means of getting money it is impossible really to advance very far in the matter of rural sanitation ?—I think it is certainly impossible to advance further without added resources and the only way in which you can increase those resources in the ordinary manner among the population is by taxation. If you can, as I have urged, improve the prosperity of the people, then there is no question about taxation.

21360. How can you improve the prosperity of the people without initiating the schemes to which you have referred and they all require money ?—That means trying to rob the Government of India as far as I can see.

21361. At the same time, unless the people of the Province put by something you cannot expect that any Government will do anything ?—That view must be accepted by all of us.

21362. Now, with regard to the question of water-supply and the improvement of tanks. You know, of course, that, in Bankura and other places, co-operative societies have been established to improve tanks ; you also know that Act VI especially provides for this scheme ; and you also know that every District Board has now got a complete table showing the various small schemes for wells and tanks that each Union might be taking up. Of course, Government have taken time but now we have got a move on. For instance, Government pay a small contribution for every scheme that is taken up under Act VI and in this way it is hoped there will be a greater advance. You will admit that Government are doing something ?—Something is being done. I have always said that the present policy will lead the District Boards to bankruptcy. Even the water-supply policy will lead Government to bankruptcy.

21363. Even in the matter of water-supply, Government are making a small contribution ?—That policy will lead Government to bankruptcy.

21364. What is your policy then ?—The policy that I advocate is the loans policy in connection with this money.

21365. If you can raise money by loans, so much the better. But you cannot find fault with Government for giving you something as it has been doing ?—It is preventing a proper policy. You cannot supply the people of Bengal with water out of revenue. It cannot be done. No community in the world can do it.

21366. But it is better to do something than to do nothing at all ?—It is not really supplying the people ; it is only providing one person here and there. It is not really touching the problem. It is preventing the problem from really being tackled as it ought to be tackled.

21367. In what way ?—If we had a proper loans policy, we would get the work done on a large scale and benefit by it.

21368. That does not mean that you do not approve of Government doing something in the matter, in the direction in which action is being taken now ? Loans will probably give us more money than we have at present, but something can be done by encouraging Union and District Boards to respond to the grant. Government have made this grant on condition that money is also found by the District Boards concerned and by the people benefited to supplement the grant, and in each district we are thus able to carry out many useful schemes. In my own Division we have now a number of tanks. I will not say we have sufficient, but we have made a move. I see your point ; you want the pace accelerated, and think we should get the help of a much larger sum of money ?—I estimated some years ago that to give a well or tank to each village would cost something like 30 crores ; obviously, if the sum required is anything like that, very little can be done with a grant of 2 lakhs a year.

21369. I admit it is very little ?—Even with a similar sum raised by the people themselves that is not going to take us very far.

21370. I entirely agree with what you have said on the subject of irrigation. You consider irrigation one of the most important problems in Bengal, both from the point of view of health and the point of view of agriculture ?—At the present moment I consider it is the problem in Bengal.

21371. On the question of co-operative anti-malaria societies and their association with Union Boards, under what Act have these Union Boards been established ?—The Village Self-Government Act.

21372. The object of the establishment of these Boards is to help the villagers to govern themselves ?—Yes, but of course the name of the Act is a misnomer. It is not village government; it is government by small districts, districts of ten or twelve miles. It is based on the old idea, which was current at one time in England, that the parish was the satisfactory unit of local Government.

21373. Do you mean the unit is not small enough ?—It is neither one thing nor the other.

21374. Would you like it smaller ?—It is not the village or anything else; it is artificial.

21375. You must have a nucleus, a sufficiently compact area, and a source from which you can get an appreciable income. If it was smaller, you would lose your income, and if it was larger, you would lose touch. I have been intimately in touch with these Union Boards for many years, and as a workable scheme it is as good as anything that could be devised. If it was smaller, you would get neither the men nor the money; if larger, you would not get that association of interest which is necessary for success: that is my opinion. The object of the Act is to establish institutions at the bottom which will help the people to govern themselves. The co-operative movement has the same object. Is it not a fact that the money which the Union Boards now give the anti-malaria societies is only given to those societies which are registered under the Act ?—A whole lot of conditions have been attached to these grants since I went on leave.

21376. There is no opposition in principle between the co-operative movement or these anti-malaria societies which will prevent their being cemented with our Union Boards. As a matter of fact, the primary societies have co-operative unions of their own, and there is nothing to prevent these co-operative unions coalescing with our local self-governing unions. We are doing that, so I fail to see in principle what opposition there is between all these institutions which are all working towards the same end ?—If human beings were perfect, they would all work together.

21377. I do not contend they have reached that stage, but that is our object, and I wanted to bring that to the notice of the Commissioners ?—During the luncheon interval a medical man called to see me from the Birbhum District and asked me whether I would go out to visit a centre with which he was connected where there were nine public health co-operative societies, which were all registered and doing good work. They are not connected with Dr. Chatterjee's movement, but they have sprung up in imitation of that movement and are doing good work independently of it. The doctor told me they were anxious to work in with the District Boards there. He is also working quite satisfactorily with the Co-operative Department.

21378. One word about the need for a Public Health Act in this Province. In the draft which was made the rural areas and the urban areas were all lumped into one. Was not that found to be one of the principal difficulties in piloting that bill through ?—It was the question of taxation that was voted against.

21379. But in it urban as well as rural areas were included. I remember it very well, because the matter was placed before us, and my District Officers thought conditions in rural areas were so different from urban conditions that one Act should not include both ?—I remember that was thrashed out before the Commissioners' Conference. There were many people who did not realise that in every civilised country in the world except this there is public health legislation.

21380. We were in favour of it, but thought there should be two separate Acts. Do you not think it is much more necessary for rural than for urban areas, because the Local Self-Government (Municipal) Act already gives power to local bodies to look after sanitary matters to some extent. There is room for improvement no doubt; but there is nothing in rural areas at all ?—The point I have raised again and again is that at the present moment in Bengal with the exception of Calcutta (which was made only by its last Act a statutory sanitary authority) we have no statutory sanitary authorities whatsoever; we have no one who is definitely charged with the care of the public health, with mandatory legislation. By its recent Act, Calcutta became for the first time a statutory sanitary authority, but there is no other one in Bengal.

Mr. Gupta : I quite agree there is room for improvement, but I suggest you should bring your influence to bear to emphasise the need for an Act to deal with rural areas first, because I take it that is our most urgent need.

21381. *The Raja of Parlakimedi :* What are the most common diseases in this Province ? —Probably malaria is the most prevalent, but there are also *kala-azar*, cholera, small-pox and tuberculosis. Malaria, however, is probably the most important single disease.

21382. May I know what your department is trying to do, apart from medicine, in the way of taking preventive measures against it ? Is propaganda being carried out amongst the people ?—Yes, we have a small publicity department consisting of two officers, who are fairly constantly on tour. They attend *melas* and agricultural shows and give lectures, magic-lantern lectures and so on. We help the local authorities in carrying out work of the same kind. We are now preparing for baby week exhibitions all over Bengal; we help the local authorities with exhibits and lectures. That has done a very great deal of good.

21383. Are the lectures all given in the vernacular ?—Almost entirely.

21384. Among the villagers ?—Yes. Sometimes I or one of my colleagues will address an English-understanding audience in Calcutta in English, but all this propaganda work is done in the vernacular, although the wording on our posters is always in English and the vernacular.

21385. Do you include in your tours visits to rural parts ?—Yes, and especially where there are *melas* or agricultural exhibitions. We have only a very small staff, two men and we have 120 towns and 84,000 villages in Bengal, so that we are only touching the minutest fringe of the problem.

21386. Do you not think the circulation of bulletins in the vernacular among the villagers will improve matters ?—We do that. We have a very large amount of propaganda literature in the vernacular, posters and that sort of thing. Cholera is rampant in a number of districts in Bengal now, and we have large pictorial posters dealing with cholera and its prevention. If small-pox is prevalent we have posters dealing with that, and these have been effective in inducing people to get vaccinated.

21387. How does the Postal Department treat you ? Do you get any concession ?—The material is practically always sent out by hand. We send the things out by rail or steamer to district headquarters, and they distribute it through their own staff. We do not use the post more than we can help, because it is too expensive ; it would swallow up a very large amount of our small resources if we were to use it largely.

21388. They do not give you any concessions ?—I do not think we have ever approached them.

21389. As regards the death rate of children, are there any statistics to show what that is ?—On the average for this Presidency it is practically always in the neighbourhood of 200 per 1,000 births. It varies in different districts from 150 to 300 per 1,000.

21390. Can you give us a rough idea of its rise and fall during, say, the last three or four years ?—Yes, I have a document here which shows the course of events for the last 40 years.

21391. Then have you taken up this also in your propaganda work as a sort of preventive measure ? What are the reasons first of all ?—There are many causes. Taking the case of infantile tetanus, on the average there are 35,000 infants dying within a few days of birth, within ten days or a fortnight after birth. It is purely and simply from dirt, the handling by untrained midwives. There are simply 35,000 infants sacrificed to ignorance and the failure to use a little amount of water, just a little care and attention would serve to wipe out that mortality wholly. As soon as we can get sufficient staff for work and propaganda we can have it stopped.

21392. Does the number of workers stand in the same proportion as that of the propagandists ?—The midwives in rural areas are mostly untrained low class women.

21393. I mean the trained people ?—They are very few in number and they hardly exist in the rural areas. It is almost impossible to get them in the rural areas.

21394. May I know what is the number available in each district ?—In each district you can count the number on the fingers of the two hands. You probably will not have more than a dozen actually trained midwives.

21395. For every district ?—In any district, except in Calcutta and in the immediate neighbourhood ; on the Asansol borders, in the extreme west of the Burdwan district they have employed a certain number of midwives and some have settled in practice ; so there are a number of trained midwives in practice in that area of 400 square miles ; but that is exceptional. We have many Municipalities, especially the smaller ones, in which there are hardly any trained midwives.

21396. What interest do these local bodies take in that line ?—Some of them have tried to employ them and now we are trying to train *dais*. We have got a certain number of classes for training the indigenous *dais* and we find the *bhadralog* ladies themselves are coming forward because they wish to take advantage of this training. It is something quite new and is a very promising thing.

21397. What provision is made for this sort of training ?—We have a small grant. The Public Health Department had a small grant which has been paid to either societies or local authorities where they can employ a medical man who will hold the classes ; he is paid a small honorarium and then we provide the midwives, the *dais* who attend them with an apparatus, with soap and needle brush, cotton for ligature and so on and we also give a small allowance as an inducement to attend the classes regularly. The movement has only been started in the last two years, but it is showing signs of having a promising future.

21398. Are these District Boards making any contribution for such training ?—The grants in certain instances have actually been made over to District Boards with a view to getting them to organise the training by means of their dispensary medical officers.

21399. But they do not set apart a portion of their revenue as a contribution for this sort of work ?—What the District Boards are feeling is that the Public Health Department wants them to do more public health work without increasing in any way their revenue. But many of them are now willing to come forward. One of the District Board Chairmen came to me the other day and told me that he was going to start propaganda throughout the district because he was convinced of the value of it and he asked me to give him advice and help because he wished to employ an officer doing nothing but this. I know he is going to do that and I am going to help him to the utmost of my ability ; but I cannot help him except by the loan now of an officer, the loan of a biescope and films, the loan of lantern slides and a gift of literature, because I have no money definitely for that purpose.

21400. How many District Boards do you try to visit every year ?—I have found it increasingly difficult in recent years to get away from office work. I should like very much to visit the whole lot of them in the year ; but it becomes very difficult now-a-days especially with the increase of legislation. These legal questions are constantly referred to the Director of Public Health, and there are questions about the Food Adulteration Act and the change of rules and so on and suggested legislation, and the Director of Public Health is asked to put up draft proposals ; and I have been told by lawyer friends that even if I had been a lawyer I would find that such work as legal drafting is not easy and it takes a very long time and you have got simply to concentrate on that and dealing with one file occupies the best part of several days, perhaps. When you have got increased work of this sort, it is difficult to do that amount of touring which one would like to do.

21401. Then as regards this statistical research work, how would you make it accessible to the rural parts, I mean the benefits of it ?—I think the first of the benefits must come to the administrator. At present our administrators are in ignorance of what is going on for the simple reason that it is impossible to judge merely from a table of figures what is going on. If each department were compelled to put up this data in the form of simple sort of graphs, it would provide a record which could be seen at a glance. If I were the Governor of a Province, for example, I would like to see every department putting up this data in that way ; then I get at a glance whether this was increasing or that was increasing and I can have various things correlated and I can find for myself if both things were moving together. It is from the education of the administrators, that the people in the rural areas will benefit. For example, I may say this that had simple graphs showing the net crop area been put up before successive Governors in Bengal, I am perfectly certain that they would have said, " We must find out what this is, we must see what can be done ; here is a net crop area being neglected steadily."

21402. So you would include also circularising the local bodies, District Boards and Municipalities ?—I would have them keep their own statistics, each one of them as regards public health matters. I have been trying to get the District Health Officers to make proper use of their statistics for educating the members of their District Boards and I am glad to say that many of them have done it. The other day a report came from one district which showed that the District Health Officer was doing excellent work in that way and was keeping that District Board informed by means of graphs and by means of maps of the condition of his district.

21403. And would you like them to circularise this information in the vernacular in their respective areas by posters ?—Yes ; as far as possible we make use of the posters ; for example, simple diagrams in poster form, things that can be of interest even to villagers.

For example, I have one diagram showing the appropriate weight of an infant at different ages. That is shown in the form of diagrams of children in an ordinary scale, children at different sizes showing the corresponding weight at which they should be, all in vernacular, so that the adults can say " Our child is so many years old and it should be of such and such a weight".

21404. For the death rate also, do you not think there should be a similar thing ?—Yes, as far as possible we make use of these large exhibitions and *melas* where many villagers come and attend.

21405. *Professor Gangulee :* You lay a great deal of emphasis on the importance of irrigation. Are you aware of the view that irrigation is also responsible for malaria ?—Yes. I believe it is a prevalent belief that irrigation is the cause of malaria in parts of the Punjab, the United Provinces and elsewhere and I believe that that belief is founded upon fact. But conditions in deltaic tracts are so different from those near rivers that one finds in deltas irrigation is not associated with intense malaria. In the Madras deltas, the Godavari, Kistna and Cauvery, where there is irrigation, there is little or no malaria and this factor has constantly been commented on. In fact these deltas were more malarious than they are now before they had irrigation. It is the same, I take it, in regard to Bengal. The areas which now get natural irrigation or semi-natural irrigation are freer of malaria than the areas that have no irrigation in Bengal.

21406. You say difference in conditions. What are the conditions ?—The time of the year when irrigation is carried out and the crop that is being raised. If you irrigate in the monsoon, in the rainy season, and irrigate wet crops, you want a plentiful supply of water and that sort of irrigation does not produce malaria. In fact it helps to remove it. But if you irrigate dry crops, you have got to irrigate through a whole series of channels and these channels which are not used during the wet season become breeding places for mosquitoes when they hold rain water.

21407. You have in the course of your evidence stated that one of the main purposes of statistics is to educate the administrators?—Yes.

21408. Is it not supposed by some administrators that statistics are useless ?—It has constantly been said that our statistics in India are useless and the critics who have criticised from that point of view are usually not those who have any knowledge of statistical methods ; because people who have had to do statistical work know very well that there are whole lot of errors and one error would tend to nullify another. To give an example, I think there are 84,000 village *chowkidars* in Bengal and these *chowkidars* are responsible, among other things, for reporting births and deaths. Some of them, probably every *chowkidar*, make an error ; they even report a birth as a death by accident. It might be thought that the effect of their mistakes would be cumulative ; but it is not so. Usually the mistakes they make nullify each other.

21409. With reference to the question of vital statistics, are you satisfied with your present arrangement ?—No ; gradually we can improve them provided we get more money.

21410. There is no use in having a statistical method evolved unless you have these reporting organisations perfected ?—There is an enormous amount of existing data in every Government office and that data ought to be dealt with properly in such a way that they could be correlated.

21411. Are you aware of Mr. Jacob's work ?—I have seen references to it, but unfortunately I have not actually read it.

21412. Are the statistics you have shown obtained from the statistics of the Agricultural Department ?—Yes, from the published statements of the Agricultural Department.

21413. You have based the graphs on the statistics already available in Government publications ?—Yes.

21414. Now, Sir Henry Lawerence made a reference to the total budget. Can you answer this ? If you split up your budget into different heads, out of the ten lakhs what proportion goes to administration and what proportion to propaganda ?—I could not give it at the moment. Of course our department is in line with other Public Health Departments. In every Public Health Department in the world, administration and staff is always the biggest item, because there is skilled work to be done. That is one of the criticisms which is almost invariably raised against public health work. People often enough prefer spending money on engineering schemes, something which they can see, rather than on employing a trained staff to carry out the work of preventing disease, because they are not able to assess the value of that.

21415. You have a Sanitary Board in this Presidency; what are its duties ? Are they advisory ?—Advisory. History shows that Local Self-Government administration in India would be bettered by establishing a Local Government Board, but I have not gone as far as that. In fact our system of Local Self-Government is so different from that of Great Britain that it would not fit in with a Local Government Board, although I really think we need it.

21416. In answer to the Chairman you have said that there is great deal of interest in public health shown by the people. Do you see a decided change in their attitude ?—There has been a tremendous change in the last ten years.

21417. Do you find the same change in the local bodies ?—Yes, very much.

21418. Do you think the impetus came from the Government ?—Possibly I flatter myself, rather I pride myself, one being one of the main agents in having assisted the growth of that movement in Bengal, and I am a representative of Government.

21419. May I ask you whether there is continuity of policy pursued by these local bodies, District Boards or Union Boards ?—It is rather difficult to answer that unless I have a concrete example.

21420. Say one chairman is keen on supply of drinking water in the rural areas, and after three years of his tenure of office, he ceases to be chairman and another man comes in whose main interest is perhaps in roads and communications. Have the District Boards, as organisations, laid out a definite policy for five or ten years ?—I do not think that has been done. I think possibly here and there recently a District Board may have done that sort of thing. I know I have myself made suggestions as to the advantage of such a policy.

21421. Therefore, I take it that there is no continuity of policy ?—I doubt very much, except the sort of natural continuity which is secured by the fact that it is much easier to run in a groove than depart from it.

21422. You say public interest in public health has been created. What is the attitude of the Legislative Council towards the whole question of public health ?—On the whole, the Council has been sympathetic towards public health matters. I remember I was not quite certain whether the Public Health budget was going to be thrown out; instead of that it was passed. I consider that we have been dealt with gently by the Council.

21423. With regard to the Hook-worm Commission, do I understand that the Council's attitude was not favourable ?—I am rather inclined to think that the Hook-worm Commission was shut out by the Council previous to the first Reformed Council. I think it was a Standing Committee that was dealing with it. But I know medical men disagreed; they did not think that there was hook-worm disease in Bengal. They were largely responsible for stopping that.

21424. So, in the present Council, you never made public health proposals ?—They are regularly put up. The Director of Public Health does not put up proposals; he is not a member of the Council.

21425. As regards the attitude of the local bodies, are they prepared to tax themselves for public health advance ?—The co-operative movement has been instrumental in inducing the people voluntarily to raise money, in other words, to tax themselves.

21426. What about the attitude of the local bodies ?—In a few of the Municipalities there is a certain amount of local taxation; a few of the Union Boards are raising money too.

21427. I see the point. They all realise the importance of having a good water-supply, better roads and so on. Do they also realise that they cannot get 9 annas worth of comfort by paying 4 annas ?—They always try to see what they can get by asking; that comes first.

21428. With regard to dietary research, Sir Thomas Middleton elicited some answers from you. Do you find any change in dietary in Bengal for the last ten years ?—I could not give statistical data, but my impression is that there is a decrease in the amount of *ghi* taken, a decrease in the amount of fish consumed, and a decrease in the quantity of milk taken.

21429. As regards Rai Bahadur G. C. Chatterjee's societies; are they really co-operative ?—A vast number of them are.

21430. The small village societies ?—The societies in the villages I visited a couple of years ago were doing excellent work.

21431. Does the initiative come from within or from Calcutta or any other urban centre ?—Originally the initiative for the whole of this movement came from Rai Bahadur G. C. Chatterjee. As I remarked to Mr. Gupta, there are now other societies springing up

exactly on the lines he initiated, but they have got no connection whatsoever with him.

21432. Can you now consider this movement as organic ?—Yes ; it is a movement which will not rise and fall with one man only, but one may by his energy and enthusiasm make a great deal of difference.

21433. Do you find the members of these societies developing, if I may say so, a health conscience ?—Some of these societies die out ; some of them as a matter of fact retain vitality and are doing wonderful work. One of them which was organised as a health society in a village about eight miles away from Calcutta is at the present time on the verge of dying out because the people in the vicinity who are cultivators and depend upon the cultivation of *pan* are in the last straits because there has been a *pan* disease for the last three years.

21434. Do you think this movement has taken root in the rural areas or do they depend upon Calcutta ?—Movements like this must depend upon people from Calcutta, if they do not get encouragement from Calcutta it is very easy to kill them.

21435. You think it has taken root in the villages ?—Yes.

21436. There are now about 1,000 societies ; supposing we take about 50 members per society there will be 50,000 members ?—No ; many of them are smaller than that.

21437. Do you find any change in the habits of the members ?—I have seen villages which have been cleaned up by the members ; they have even cleaned the village drains themselves by their own labour. That is something remarkable for Bengal villagers to do. They cut down bushes and shrubs and sprinkle kerosene oil over stagnant pools.

21438. Do you consider their work efficient ? Do you think the question of malaria can be adequately dealt with in this piecemeal way ?—In one of the notes I circulated I refer to this very subject. I myself am not at all convinced by careful investigation that the so-called jungles have very much to do with malaria. I have opposed Government cutting down jungles with a view to reducing malaria, but I will not prevent the village societies cutting down the jungles.

21439. That has an educational value ?—Yes ; it is not merely for malaria, but it is for other things. If they cut it down, it may not reduce malaria, but it will do no harm.

21440. The whole question of malaria in Bengal cannot be solved by just cutting down a few trees here and there or sprinkling kerosene oil over the stagnant pools ?—I do not believe this movement by itself is sufficient, but, on the other hand, I do not believe that we can tackle malaria without it.

21441. With regard to baby shows, do the women-folk attend them ?—Yes ; the amount of interest shown by women in it is rather surprising ; for the *purdah* women we made special arrangements and they came down in crowds.

21442. Do you know the results of your propaganda ?—We have no means of testing ; it is only time that can show.

21443. With regard to the trained *dais* that you have referred to, are they not mostly Christian converts ?—Those that I am speaking of are village *dais*.

21444. What about their religion ; are they Hindus ?—Hindus mostly, or Mussalmans, as the case may be.

21445. A great deal of discussion took place this afternoon about village Union Boards ; am I right in thinking that you do not seem to be in favour of village Union Boards ?—I have explained it in the note, of which the Secretary has asked me to submit copies, but it is not for definite publication. That note will give you my ideas, and I think it will answer some of the questions which the Chairman asked me. The Commission might read that note ; it gives my views and reasons. I do not think that what has failed practically in almost every country where such a movement has grown, will succeed in India. It has failed in Italy, it has failed in France, and so on, and it has also failed in Great Britain. I do not think it can succeed here.

21446. You will agree with me that we have got to strike at this a sub-stratum, some unit, for reconstruction ?—Yes.

21447. What would be the suitable unit for rural reconstruction in Bengal ?—That is the point. I am in favour of a system of *ad hoc* authorities. I would like to see not merely one body dealing with a multiplicity of functions ; I believe we should have Local Boards dealing respectively with sanitation and public health matters, and other boards dealing with education, and so on. I believe that it is only by a system of that sort that we can hope to achieve some success.

21448. You have got a Sanitary Board in the Province ?—The Sanitary Board is for the Province as a whole. What I want is a smaller local sanitary board of health, for

an area of the size of, say, a *thana,* charged with sanitary authority, responsible for public health in that area, and employing a small staff for the purpose.

21449. In this printed note, you make a reference to fruit cultivation and also pisciculture. At any time, did you sit round a table and discuss the problem of fruit cultivation and pisciculture with the Director of Agriculture ?—We may have discussed the question of fish, but I do not think we discussed the question from the point of view of pisciculture. A few years ago, when I was taking up the question of the relation of fish to mosquito breeding, I got some suggestions from the Director of Fisheries ; the Director of Fisheries is also the Director of Agriculture.

21450. Do you meet the Irrigation Department sometimes ?—We have to do a good deal on behalf of them ; we constantly exchange information and assist one another mutually.

21451. *Mr. Kamat :* You said cholera could be wiped out within three years if certain measures were taken ?—Yes.

21452. I have also heard a very pathetic story that a good many schemes for rural welfare are held up for lack of finance ?—Yes.

21453. At this late hour, I want your opinion only on one point. From your observation of the economic condition of the people and your study of agricultural statistics, do you believe that there is prosperity, considering the present prices which the cultivators get for their products ?—There was prosperity last year in Eastern Bengal, when the prices of jute were high, but I understand that there is no longer the same prosperity, and that the price of jute has fallen.

21454. It would not be fair to single out a particular year ; I want your opinion generally. Can you say whether, during the last five or ten years, the people are economically rather going down or whether there is some sort of prosperity, whether there is some margin left for them economically ?—You mean to say for a term of years ?

21455. Say during the last seven or eight years ; I would not go far beyond that ?—I am afraid I would not like to give you a definite opinion in regard to that, unless I had the opportunity of examining the whole lot of existing statistical data. Provided I could have the time and I could examine that data, I could give you a very definite answer.

21456. I am asking you whether you have any impression on this point. I want to know whether there is, really speaking, unwillingness on the part of the people of this Province to raise additional revenue to save millions of lives from cholera and malaria ?—If you ask me that question it is a very very difficult matter to raise money in Bengal ; the cultivating classes do not ordinarily possess very much money ; even when they possess products, they have to sell them for money. Money to the cultivating classes is not what money is to us ; they have to purchase money when they require it ; money to them is a commodity which they must buy with their produce. That is not enough understood very often on this question of taxation. When we had the system of licensed vaccinators in Bengal, the vaccinators were allowed to exact fees ; that was considered an immense hardship by the people, and often enough the vaccinators found it exceedingly difficult to get their fees. Anybody who is familar with Bengal and who has gone about in the villages knows that if you want to raise a given amount of money from a man, you will find perhaps very great difficulty in doing it ; the man has got to go and get it from the *mahajan,* because he has not got it in his hands.

21457. You have just now said that the average amount which a man pays is about 4½ annas for the local areas and about Rs. 2 per head is the general revenue of the Province ?—No, excuse me ; I said that the total revenue of District Boards is only 4½ annas per head of the population in the area, that is to say, the total income.

21458. And Rs. 2 per head is the general revenue of the Province ?—The Province gets Rs. 2 per head as its share of the total amount of revenue raised.

21459. My point is not whether it is Rs. 2 per head or something more or less. I ask you whether there is any margin, from which the man can afford to raise the revenue from Rs. 2 to some higher figure ?—If the price of agricultural produce rises, they can do it in the rural areas ; if it falls, they will find it exceedingly difficult.

The subject requires closer investigation.

(The witness withdrew.)

The Commission then adjourned till 11 a.m. on Monday, the 6th December, 1926.

Monday, December 6th, 1926

CALCUTTA

PRESENT :

The MARQUESS OF LINLITHGOW, D.L. (*Chairman*).

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S.
Sir THOMAS MIDDLETON, K.B.E., C.B.
Rai Bahadur Sir GANGA RAM, KT., C.I.E., M.V.O.,
Sir JAMES MACKENNA, KT., C.I.E., I.C.S.
Mr. H. CALVERT, C.I.E., I.C.S.
Raja Sri KRISHNA CHANDRA GAJAPATI NARAYANA DEO of Parlakimedi.
Professor N. GANGULEE.
Dr. L. K. HYDER.
Mr. B. S. KAMAT.

Mr. J. N. GUPTA, I.C.S., Rai A. C. BANNERJI Bahadur } (*Co-opted Members*).

Mr. J. A. MADAN, I.C.S., Mr. F. W. H. SMITH. } (*Joint Secretaries*).

Mr. G. MORGAN, M.L.C., Proprietor, Morgan, Walker & Co., Calcutta

Replies to the Questionnaire

QUESTION 4.—ADMINISTRATION.—(*b*) I consider that each Province should have a complete expert scientific staff of its own. It is not necessary to specially increase the scientific staff of the Government of India. Provinces vary so considerably that the provincial staff could deal with their requirements more effectively. The Government of India can act as a co-ordinating body.

(*c*) (i) Yes, so far as it is possible at present.

(ii) Yes, except where the railway is apt to starve stations where there is no steamer competition.

(iii) No, there are not enough roads owing to the District Board's fear of increased taxation and to a considerable want of interest. In lower Bengal water-ways take the place of roads to a considerable extent.

(iv) Yes.

(v) Yes.

(vi) Yes.

QUESTION 5.—FINANCE.—(*a*) I consider that only in co-operative credit societies can the better financing of agricultural operations be done, and short and long-term loans be given on advantageous terms.

(*b*) I can explain one difficulty when giving oral evidence.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(*a*) (i) Marriage ceremonies, *pujah* celebrations, death ceremonies, seed and cattle purchase generally require considerable borrowing.

(ii) The local moneylender principally and co-operative credit societies to some extent.

(iii) Low prices for produce when there is over-production.

(*b*) Land mortgage banks might be established, preferably co-operative, to free the cultivators from their mortgages.

QUESTION 10.—FERTILISERS.—(*a*) Yes, but the cost is practically prohibitive.

(*b*) Laws can be passed, but adulteration is prevalent in most trades and very difficult to prevent. Only very flagrant cases can be dealt with.

(*c*) No method would be of any use unless the cost were low enough to enable cultivators to use them freely.

(*d*) I do not know of any.

(*f*) This is a necessity and should not be discouraged, unless a substitute could be supplied at practically a gift price.

QUESTION 11.—CROPS.—(*a*) (i) The existing crops are quite all right for this Province. Experts can investigate the question from a pure seed point of view.

(ii) Bengal grows a great variety of crops. New crops are not necessary but fodder crops could probably be grown on parts of high land during the rains and on other lands during the cold and hot weather.

(iii) This is a very big question but the Agricultural Department is doing its best to make the ryots familiar with good tested seed. I suggest that the co-operative sale and supply societies should be made the local distributors for the Agricultural Department.

QUESTION 12.—CULTIVATION.—(i) The present systems are suitable for the land and conditions prevailing.

(ii) The cultivator is quite alive to the question of rotation of crops where it is feasible.

QUESTION 14.—IMPLEMENTS.—(*a*) The implements at present in use are suitable for existing conditions. I know of no new implement or machinery which would be of any use in Bengal.

(*b*) None.

(*c*) I know of none.

QUESTION 16.—ANIMAL HUSBANDRY.—(*a*) (i) So far as Bengal is concerned, it is difficult for cultivators to keep a decent breed of cattle owing to conditions during the rains, and having regard to the cost of feeding.

(ii) I would draw attention to the action of the Corporation of Calcutta in this respect. The Corporation has subsidised the Milk Union but I do not know whether the milk reaches the consumer in a pure state.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(*a*) Cultivators generally begin to prepare their ground in the end of January and during February, according to weather conditions, and from that period their time is fully occupied with jute, and paddy seedlings, till the jute crop and *aus* paddy have to be harvested. After this, the harvesting of *aman* paddy comes on. During the cold weather, various crops are grown and so on until the ground has again to be prepared for jute, and paddy seedlings. One crop areas, such as Backarganj district, may have a period of unemployed time. This may account for administrative troubles in the said district.

(*b*) I cannot suggest any other subsidiary industries than those which are being done at present.

(*c*) These industries are more or less being carried on at present and there are no obstacles in the way of expansion, except the difficulty in selling at a profitable rate.

(*d*) All these industries are practically in existence where it is possible to work them at present.

(*e*) This I consider is not possible generally, as industrial concerns require whole-time and skilled labour.

(*g*) There is no actual unemployment in rural districts, so far as I know.

(*h*) Even in large towns amongst educated people this is difficult to attain.

QUESTION 20.—MARKETING.—(*d*) There is very little that the people engaged in agricultural pursuits upcountry do not know about markets. Even the state of the London jute market is known in the villages in Bengal.

QUESTION 22.—CO-OPERATION.—(*a*) (i) Government supervision and audit is absolutely necessary, and adequate staff must be provided for this purpose. Each society would have to be started by Government so far as rules and regulations are concerned. The actual working of the society must be done by the members themselves through managers and boards elected in accordance with their rules and regulations.

(ii) No, there will be no confidence in non-official agencies.

(*b*) (i) As the greater portion of rural areas is unsuitable for ordinary banking operations, the co-operative credit societies are the only channels through which the money in the hands of cultivators can be secured for general operations.

(ii) These should be successful in supplying in bulk articles necessary for village requirements such as corrugated iron, kerosene oil, piece-goods, rice, etc.

(iii) This is quite a new movement and if there is proper administration and close supervision in the rural centres it should prove successful.

QUESTION 23.—GENERAL EDUCATION.—(*b*) There is no method I can suggest, as an agriculturist will lose interest in the land as a business, in which the work has to be done by himself, if he once takes to education higher than the three R's.

Mr. G. Morgan.

QUESTION 24.—ATTRACTING CAPITAL.—(*a*) It is difficult to suggest where more capital and enterprise could be placed so far as area is concerned. The density per square mile is at present more than it should be. More capital could no doubt be employed but the question is could it be done profitably?

(*b*) What is meant by "owner"? A zamindari can be owned by many people. Joint ownership makes any co-ordination for the improvement of properties almost impossible. Zamindars' main interest is centred in the collection of rents.

QUESTION 26.—STATISTICS.—(*a*) (i) Unless the whole Province is cadastrally surveyed it is almost impossible to obtain anything approaching correct figures.

(ii) The Agricultural Department claim to do this fairly successfully by tests of crops taken from the fields in various districts.

Oral Evidence

21460. *The Chairman* : Mr. Morgan, you are proprietor of the firm of Morgan, Walker & Company?—Yes.

21461. You have given the Commission a note of the evidence which you wish to lay before us?—Yes, I am only sorry that it is not so full as I should have wished. I have done my best to give as much information as possible but I have not been able to do justice to it. I did not wish to give evidence but I was told I could not withdraw my name. I had really been too busy to go into any details.

21462. Do you wish to make any statement at this stage or shall I proceed to ask you a few questions?—I have no statement to make.

21463. In answer to our Question 4 (*b*) you give it as your view that each Province should have a complete expert scientific staff of its own. What is your impression about the co-ordination between Province and Province?—I should think that between Province and Province it ought to go through a central body.

21464. So that you think that the central body would be useful in co-ordination?—Yes.

21465. Would you also suggest that a central research department might well address itself to the problems which are in the main of a fundamental character? There are certain problems which are of general application. Are there not?—I think you want a central body for both but it should be only a co-ordinating body.

21466. Would you amplify a little what you mean when you say in answer to Question 4 (*c*) (*ii*), " Yes, except where the railway is apt to starve stations where there is no steamer competition."?—We have got some stations which are entirely served by the railways. The natural feeling is, of course, to supply us with wagons if they have them. I might first explain that jute is a seasonal commodity and therefore there is a tremendous rush for wagons for it. The busy season lasts only for about three months in the year. They might be inclined, I cannot say if it is a fact, to keep the stations in which there is competition better supplied than others. I have been on the Eastern Bengal Railway Advisory Committee and during the last two or three years I have not found any real difficulty in any of the stations so far as the wagon supply was available.

21467. Whom did you represent on the Railway Advisory Committee?—I was one of the representatives of the Bengal Chamber of Commerce. There are two representatives from that Chamber.

21468. Who represents the growers?—There are five or six Indians. Mr. Gupta is one of them. They represent Indian interests.

21469. Are there not elected Members of the Legislative Council who are members of this Advisory Committee?—I think they have got a number of them. The Corporation has got a member and the Indian National Chamber of Commerce has also one.

21470. Do you ever have complaints from the growers on that Committee?—Not from the growers themselves. They could not very well get through to us but we receive their complaints through the people who want to ship jute. These are the people who bale jute at the centre where the railway station is.

21471. On the whole you think that the railways give you satisfactory service?—I think so.

21472. It has been alleged before the Commission that railway wagons are sold by local stationmasters or the persons who are in authority at goods yards. Have you ever come across cases of that sort?—I could not give you any specific cases but it is a general idea that wagons can be got by other means than registration.

21473. How about the supply of wagons?—The supply of wagons is a difficult question because, as I said before, jute is a seasonal crop. You cannot expect any railway to give the full supply of wagons in a period of about three months. The registration is done in such a way as to take off as much jute as is possible from the presses. This is done during August, September and October. The railways are very hard put to it at that time and one of the difficulties is the turning round of wagons at this end. The broad gauge wagons are sometimes held up by all sorts of things and they are not always turned round to the centres where the railways themselves would like to take them. People do not unload in time.

21474. Is the difficulty inherent in the provision of sufficient railway trucks to deal with the seasonal crop? Do you think the railways do reasonably well?—I do.

21475. On page 272 of your note in answer to Question 5 (*b*) you say that you can explain orally to us how it comes about that cultivators are not always very ready to take advantage of the Government system of *taccavi*. Could you please tell us what it is?—That is purely a story. It applies to most of the things. I cannot give places or names because it is only a story. Some years ago a Deputy Commissioner was not satisfied that the men who took the loan got their full amount. So he said he would do it himself and he did it himself. With his own hand he wrote " Money given in the name of advance " and gave out the money. A short time afterwards one of the people who got money came back and put Rs. 5 on his desk which annoyed the Deputy Commissioner. He said, " What is this? Take it away." The man said, " This is for you." He said, " No, no. Take it away." To make a long story short, the Deputy Commissioner asked him what was his explanation. He said, " A short time ago you gave me Rs. 40 loan and I have only got Rs. 5 left and I have not been outside the compound. It is of no use to me and so I will give it back to you." That covers a wide area but it is merely a story.

21476. *Sir Henry Lawrence*: Is that a verified story or mere gossip?—That is an old story.

21477. *The Chairman*: Beyond that you do not wish to say anything on the question of *taccavi*?—No.

21478. Are you familiar with the agricultural side of the jute industry?—Yes, fairly familiar.

21479. Is it your view that fertilisers might be more generally used with advantage?—The low land jute that comes under water has its own fertilisers in the shape of silt. The difference between low land, middle land and high land is only a question of a few feet. It is not a question of hundreds or thousands of feet. Most of the jute land comes under water. Most of it is covered with river water and the whole of the Brahmaputra water goes right down from the north to the south over the whole of the low land of Bengal and all that silt is a fertiliser in itself. I do not suppose for a moment that it would be of any use putting on artificial fertilisers because the floods would wash them away.

21480. *Sir Henry Lawrence*: Is jute grown in running water?—The whole of Lower Bengal is under water; it is moving of course all the time but not like a stream.

21481. *The Chairman*: Would you now turn to page 273 of your note, in answer to our Question 20 on Marketing. Have you yourself examined the avenues of distribution from the grower to that part of the market with which you are familiar?—Yes, I know it.

21482. Would you describe precisely what takes place when a cultivator's crop is ripe? How does he pass it on?—The cultivator, whose crop is ripe, is approached by the smaller man who goes from house to house, and collects small quantities and sells his produce at that particular time. This smaller man supplies the bigger *bepari* who collects in larger quantities and takes it to bigger centres.

21483. Is the purchase outright by the primary collector or the small man?—So far as I am aware, yes.

21484. He does not act as a broker or commission agent?—He might act as a commission agent to the *bepari* but as far as I know he buys the stuff outright.

21485. And he sells it to the big man?—Yes, he sells it to the *bepari*, and the *bepari* brings it into larger centres such as at Chandpur and other places. If he is advanced money by the baler himself, which used to be the universal practice, then he goes straight to his godowns. If he is advanced money by an *aratdar* and if the *aratdar* is going to take his commission, then he has got to go to the *arat* of this man and sell his jute where he is ordered to go. If he is connected with an *aratdar* he cannot go to any godown he likes.

21486. *Sir Henry Lawrence*: What is an *aratdar*?—A moneylender who has godowns which he lets out on hire for depositing goods in; he also charges a commission for arranging the sale of the *bepari's* goods, and so on.

21487. *The Chairman*: He is a commission agent in that sense?—Yes. He used to advance money to practically all the *beparis* in the jute trade.

21488. Does that mean, that practically speaking, the *aratdar*, through the *bepari*, finances the cultivation of jute?—No, he finances the *bepari* to bring in a certain quantity of jute. If he had a boat of 1,000 maunds and the price was Rs. 8, the *aratdar* would advance Rs. 4 a maund on the boat's capacity, and when the boat came in he would pay him according to the market rate and less commission.

21489. Who finances the cultivator?—The local moneylender and the co-operative credit society.

21490. Is the small *bepari* the same as a moneylender as a rule?—No, moneylending is generally a trade by itself. I fancy the Marwaris in Western Bengal and Assam advance a good deal against the crops.

21491. Is it really the case that a Marwari, if as a moneylender he has advanced money to a cultivator, stands aside when the crop is ripe and allows a small *bepari* to come in and purchase the crop from the cultivator?—Not if he has advanced against the crop. That is done in Western but not in Eastern Bengal.

21492. Let us take Western Bengal first. What happens if the small *bepari* has advanced money against the crop?—Then the other man will not have advanced as well. They will not both have advanced against the crop.

21493. Where a Marwari has advanced, does he take the crop himself?—He works on the system of a certain percentage of it. There is what we call the *burga* system, which is half the crop against a certain amount of money advanced. He has a lien on the crop if he has advanced money against it.

21494. Do you know at all what the effect of those conditions may be on the price obtained by the cultivator?—I think they may have a tendency to make the price he gets lower than it would be if he was free.

21495. How far is the price to the cultivator fixed by supply and demand, and how far is the bargaining power of the cultivator affected by the fact he has borrowed money from these people?—I should say on the whole it is governed by supply and demand.

21496. Even in cases where the cultivator is in debt?—Yes.

21497. Is the price of the raw material at the cultivator's end of the chain of marketing a thing which is well known by the cultivators?—I think so.

21498. Do you think the cultivators are in touch with the market?—I think the cultivators are in touch with all the local markets, and the local market's information comes straight through from Calcutta.

21499. Do the large firms dealing with jute ever buy direct from the cultivator?—Not as a regular business. At one place I was at, a small *dinghy* would occasionally come in from somewhere close by and sell his jute, but that was not the way the business was ordinarily done; it was mostly done through the bigger *beparis*.

21500. Probably there is not enough jute bought from the cultivator by buyers for large firms for the practice to have any effect on the price the grower obtains?—No.

21501. Can you tell the Commission anything about the margins on which these various intermediaries operate?—The intermediaries do not always make a profit, of course, but supposing it is on a profit basis we usually calculate that the difference between the price at Calcutta and the village price is from Rs. 2 to Rs. 2-8. That includes all the charges to land the jute in Calcutta.

21502. *Sir Ganga Ram*: Is that per maund?—Yes.

21503. *The Chairman*: One question about the *aratdar's* godowns. Does the jute lying in one of those godowns still belong to the *bepari*?—He does not take it out of his boat and load it in a godown unless he wants to store his jute and go back for more. What happens is that the boat comes alongside the office of the *aratdar*, and the man waits there until he gets instructions to go to A, B, or C's godowns, wherever the *aratdar* has his business connection.

21504. Where is the pressing done?—In those premises. They land the jute, put it in the import sheds and then it is bought and passes into the assorting sheds and so on to the press house.

21505. Have you experience of the co-operative selling of jute?—I have just begun to get experience.

21506. Have you had sufficient experience to come to any view about it?—Of course, it is on its trial at the moment. There are great possibilities in it, and

there is no reason why it should not grow every year, but the upcountry administration must be good and well handled to make it a success.

21507. You have described the chain of intermediaries who handle the jute under non-co-operative arrangements. Which of these intermediaries is cut out by the operations of the co-operative society?—I take it the co-operative societies will arrange their own transport. It is transported from the village to the centre of pressing which is the important point. If they have their own co-operative people to do the transport and arrange for their own boats, they can carry it straight into the centre. That, I take it, is what it is ultimately hoped to do under the co-operative system.

21508. What plant have these societies? Have they their own godowns?—They have hired godowns in two or three places.

21509. Have they their own presses?—The presses and godowns are one.

21510. They always go together, do they?—Yes.

21511. The co-operative societies are taking their jute into the final market?—Yes, to supply it to the mills here.

21512. But it is early yet to give any firm view about it?—I would not care to give any final view about it now. It is too novel; they are simply feeling their way.

21513. Have you any idea what it means to the cultivator in terms of better prices?—It will mean, of course, that all the money from start to finish will go to the society. The *bepari* might buy at a certain price and on a rising market bring it in and get the benefit of that rise, but markets are not always rising; there is always the chance of a falling market. I take it the co-operative idea is that the cultivator has the jute in his hands from start to finish, and he can sell when he likes and hold when he likes.

21514. Who takes the trading risk in the case of the co-operative society?—If the cultivator is a shareholder in the business, he will take it.

21515. He takes the risk in so far as he is a shareholder, but not as an individual?—The co-operative idea, I understand, is that he becomes a shareholder and takes the risk one way or the other; if there is a profit, he gets it; if a loss, he has to help to bear it.

21516. It makes a good deal of difference whether he obtains the market price as a cultivator, and a dividend or bonus if the society makes a profit, or hands in his jute, obtains a percentage of the estimated price, and gets the balance when it is seen what price the jute actually fetches on the market?—I do not know whether they are going to work right down to the cultivator, or whether the central societies are going to take that risk.

21517. You give us an opening to ask you one or two questions on the subject of the welfare of the rural population. Is there any branch of that subject with which you are particularly familiar?—With regard to villages in the mofussil the main things are drinking water and medical aid. The housing they do themselves; as to hygiene, a great deal is swept away every year with the floods.

21518. Have you considered the practical steps which might be taken to improve the water-supply?—Tanks are about the only thing in lower Bengal. In the high lands which are not subject to floods something might be done with the tube wells, especially in the bigger places. In most villages tanks are the only thing except in the high lands, where a cheap form of tube well might be used. Tanks must be kept clean and clear, and in the case of wells it is necessary for the water to be carefully tested, because if they ran into bad subsoil water they might all be poisoned. I think the tank will be quite good in Bengal provided there is no contamination, *i.e.*, so long as it is carefully guarded by the people themselves. I think (*b*) of your question is a matter which could very usefully be undertaken. An economic survey of a typical village in Eastern and Western Bengal might be made. I do not know what the agency should be; they have their own *panchayats* now and certain officers under the Village Self-Government Act passed last year. Where there are co-operative societies, it might be done through them.

21519. With what accuracy is it possible to forecast the general trend of movement in the jute market sufficiently far ahead to assist the cultivator in deciding how much of his land he is going to put under jute?—We had a long discussion on Saturday with His Excellency in connection with the jute forecast. As it is at present the cultivator gets a high price one year, and thinking it is going to last

he sows too much; then he gets a lower price, and he cuts down his area. That has been my experience of jute. But the suggestion might be made that the Director of Agriculture might be able to give information about the extent of the old crop in the hands of manufacturers, that is to say, whether they have a three months' stock, four months' stock, and so on, of the raw material in their godowns from the crop which has been held over. That should be made known in January, because they have to begin to sow the jute in February. If that stock was known to the cultivator he might be able to keep a more or less constant sowing, unless one man wanted to sow more than his neighbour.

21520. The consumption of jute is more or less stable?—Everybody knows what the consumption of jute is; the figures are available to anybody, and it is practically stable.

21521. Under existing conditions does anybody know how much jute there is in stock?—You mean in manufacturers' hands?

21522. Yes?—A statement is issued every month. The mills know that. In France, Germany and America they collect these statistics.

21523. And publish them?—I do not know whether they publish them abroad; but they are known to the trade.

21524. So that all the essential facts, which are required in order to be able to give the cultivators an idea as to the probable trend of prices, are available?—They are available.

21525. It is only a question of putting them together and placing them at the cultivator's disposal?—Yes.

21526. In your opinion, would that be a good service to render to the cultivator?—I do not see why he should not understand it. There is no reason why the rural areas should not know what the stock is that is being carried forward out of a big crop or a short crop. What we should like to aim at in jute, although it would do away with the gambling element in the trade, is to have a more or less constant stable supply which we put down at 90 lakhs of bales per annum. This year's estimate is about 108 lakhs. The thing is, in jute, if you get a little over the actual requirements of the mills you get a very much larger proportionate fall in prices.

21527. How long have you been in the trade?—I have been 37 years in India and another four years in Dundee and London.

21528. Do you think the market is more, or less, stable now than it was thirty years ago?—There is a much more speculative element now.

21529. There is more variation in prices?—There is quicker variation in prices. In the early days it fluctuated, but with nothing like the rapidity with which it fluctuates now.

21530. *Sir Henry Lawrence*: You have been working upcountry, I understand?—Yes, for some years.

21531. Do you know the sanitary condition of upcountry towns? You were Chairman of your Municipality?—I was Chairman of the Narayanganj Municipality for many years.

21532. Are the sanitary conditions of upcountry towns satisfactory?—They were quite satisfactory.

21533. Do you get a local supply of sweepers in this part of the world?—Yes.

21534. Have you a regular caste of sweepers?—Are you talking of the rural areas?

21535. Yes?—There is a sweeper caste.

21536. Not only in the Municipalities but also in the villages?—I presume the villages have their own sweeper caste, but I have never gone into that question. In the Municipalities they have their own sweeper caste.

21537. Indigenous or imported?—Some of them are imported; some of them come from Bihar, I think; I do not know where they come from actually; but there is a lot of imported sweepers.

21538. Imported from what part?—In the Municipalities they come from Bihar or the United Provinces; I cannot tell you from where exactly.

21539. So, to afford effective sanitation you have to depend on imported labour?—For Municipalities, yes. I think I am right in saying that.

21540. You do not know whether those men are available in the smaller villages?—Not to any extent. After all the sweeper's work in the village does not extend to much. As regards the municipalities it is, of course, different.

21541. In other parts of India sweepers are imported from villages into Municipalities.—Are they?

21542. You spoke just now of the need of dispensaries which do you regard as more important—medical aid given through dispensaries or sanitary measures?—They are both important. These village people are always clean. As a rule the village is kept comparatively clean, although outside the village you find a lot of rubbish lying about. The people themselves keep their houses very clean indeed. They are very clean in that way, but the cleanliness does not extend very far away from the house. We have periodical flooding out every year in the lowlands.

21543. In your own Municipality of Narayanganj, do they spend more money on dispensaries or on sanitary measures?—I could not tell you the figures. We had sanitary measures and we had a hospital.

21544. Does any considerable proportion of the population take advantage of that hospital?—Yes; it is very well attended. As you know these hospitals are dispensaries as well as wards; they always combine the two.

21545. There is no prejudice in that town against Western medicine?—Not that I know of.

21546. Do not people prefer to go to *hakims* or *vaids*?—That is a more modern movement; it was not the case in my time, it is an outcome of the last ten or fifteen years.

21547. *Sir Ganga Ram*: Your firm is a firm of brokers?—Yes, jute brokers.

21548. How many jute broking firms are European and how many Indian?—I do not know how many Indian jute broking firms there are.

21549. How many are European?—I should think, if you exclude the jute balers who broke their jute themselves there must be about 20.

21550. You do not know how many Indian firms there are?—No. I could not tell you.

21551. Can you not give a rough idea?—No.

21552. Are the fluctuations in the price of jute very violent from day to day or only occasionally?—It all depends on the market.

21553. I know something about cotton, but not about jute in Bengal?—It is very similar. If you know about cotton, you know what jute does.

21554. Are the fluctuations very violent or only occasional?—Sometimes they are very violent and sometimes they are not. For instance, the market at present has been more or less within a very small margin for the last six weeks. Last year we did not know whether it would be Re. 1 or Rs. 2.

21555. Are these prices published in the papers?—Yes; people know the market rate.

21556. They say the fluctuations of the finished article are published, but not of the raw material?—If you see the *Statesman*, you will see the fluctuations of the raw material from day to day.

21557. Is there any system of marketing where the fluctuations are published by the Director of Agriculture?—You mean daily?

21558. Yes; we have that system in the Punjab?—We have not got that system.

21559. Do your agents keep up-to-date knowledge of fluctuations?—Which agents?

21560. The agents who sell on behalf of co-operative societies to the mills. We were told yesterday there are societies whose agents' business is to negotiate with the mills?—Have they an agent in Calcutta?

21561. Yes, the village societies have an agent. That is what Mr. Mitra told us?—The village societies, I understand, appoint their own managing committee.

21562. Where?—In their village or group of villages. I understand that those groups will appoint a central managing committee in big centres like Chandpur and Narayanganj, and they will appoint an agent in Calcutta. But mind you, this is more a future than a present arrangement. I understand that is what they are doing, but I do not know exactly.

21563. You know the fluctuations from hour to hour?—It is our business to find them out, if possible.

21564. Can you tell us what proportion of your jute is exported and what proportion is consumed in the mills?—Roughly 55 lakhs are consumed in the mills and 25 lakhs are exported.

21565. Are you talking of export of raw materials or of the finished article?—I am talking of the raw material.

21566. Is the finished material exported?—The whole of the mills' finished material is exported.

21567. Not the whole; something is consumed in India?—Most of it is exported from Calcutta.

21568. What is the proportion exported overseas?—I do not know the proportion, but it is enormous.

21569. Is there any pooling system between mill managers? Do they come to an arrangement as to what rate they should buy at?—No.

21570. Is there any pooling system between the firms of brokers?—No.

21571. Each works independently of the others?—Yes.

21572. What is the depth of water necessary for the growth of jute?—If I may use a Bengali expression *jag*, if bundles of jute are put together in a *jag*, you want from 3 ft. 6 inches to 4 ft.

21573. Is that a necessity for growing jute?—Jute cannot be ready for fibre unless it is retted, and it cannot be retted unless it has got water.

21574. You stated to the Chairman that jute grows in very deep water?—It grows in all depths up to 8 feet of water; it grows even in 2 feet of water and less.

21575. Does it grow on high land?—Yes.

21576. In the United Provinces, they have started growing it on high land?—They are irrigating it there.

21577. Irrigation does not amount to 8 feet of water?—That is so, but you will not get it of good length unless you have a fair amount of water.

21578. The deeper the water in which it is grown, the greater the length?—A good proportion of water with favourable climatic conditions will certainly encourage a good jute plant.

21579. Is there no system here like the one we have in the Punjab for cotton? You know the grower puts the raw material on the cart, goes to the market and sells direct to the manufacturer?—Practically none; there may be a little of it up and down the river.

21580. He must sell it through the broker?—He does sell it through the broker; he cannot sell it direct. There are many things to be done besides the selling, there is the office work.

21581. You have no other middleman, who is neither the manufacturer nor the broker, but who simply advances some money, gets the jute, and after cleaning it sells it?—You mean the upcountry man who bales?

21582. I mean, in Bengal is there any firm of that kind?—I do not understand the question. First of all there is the buyer, then there is the broker who sells to him, and then there is the baler upcountry who sells the bales.

21583. *Dr. Hyder*: Sells to whom?—The baler upcountry is the seller to the mills, through his broker.

21584. *Sir Ganga Ram*: The mills have no baling presses?—Two or three of them have baling presses.

21585. I understand there is a middleman or a middle-firm which advances money beforehand and simply takes the raw material, cleans it, and then sells it to the mills. Is that right?—I have not heard of it.

21586. Is there any association called the European Jute Dealers' Association?—There is the Calcutta Jute Dealers' Association.

21587. Are there any Indians in it?—No.

21588. Is there a similar Jute Association of Indians?—I do not know; as a matter of fact, they have got two associations, they are sellers.

21589. Have the European Jute Dealers' Association got any pooling system?—It is not the European Jute Dealers' Association; it is called the Calcutta Jute Dealers' Association.

21590. I asked whether this association has any Indians in it?—No. We sell; take our own firm, we sell native *mavari* jute on undersigned contracts: we sell *mavari* packed jute on undersigned contracts; that means that the whole liability is on us.

21591. Do you fix a forward rate?—It has nothing to do with that. The reason why this Jute Dealers' Association is in existence is because the Association has to take practically the whole of the risk of all the native jute that is sold to the mills.

21592. That is apart from the brokers?—We do the broking.

21593. For instance, is your broking firm a part of the Jute Dealers' Association?—We are members of it.

21594. You just now referred to the charge of Rs. 2-8-0, what does it represent?—Rupees 2-8-0 represents the charge for taking the jute from the village and landing it at the mill's jetty in Calcutta.

21595. What is the price of jute?—To-day it is Rs. 10 in Calcutta.

21596. Does not that mean 25 per cent. loss to the grower?—It is not a loss; if he carries it himself, he has got to bring it to Calcutta.

21597. Carriage does not cost so much?—Some one has got to do it.

21598. Actually does it cost so much as that?—That is my estimate of what the intermediaries would expect to make out of the transaction, buying from the village and selling at the jetty of the mill. There is the steamer and railway freight, there is insurance, and all sorts of things.

21599. It has come to our notice that last year, for instance, although the price of jute was Rs. 30, the growers got only Rs. 20; is that right?—I could not tell you what the growers got.

21600. Could you not say roughly what they got?—Even roughly I could not possibly tell you what the growers got.

21601. Anyhow, the loss or profit out of the fluctuation goes to the European Dealers' Association, and the grower has nothing to do with it?—We have nothing to do with fluctuation at all; we are brokers.

21602. But you said you were members of the Dealers' Association?—We call ourselves dealers, because we give undersigned contracts on behalf of the native sellers; we have nothing to do with the fluctuations. One of our rules is that we must buy and sell at the prices offered.

21603. Who indulges in this speculation?—Gamblers in the market; the one in the Bhitar Bazar is the leading Association.

21604. Do they also advance money for the purpose of buying?—We are getting on to Calcutta markets and speculation, which has nothing to do with advancing money; you are rather off the line.

21605. Do these people, who you say are gamblers, advance money to the growers?—They have nothing to do with that part of the business.

21606. They do not handle the material at all?—You know what cotton futures are; it is the same thing.

21607. *Sir Thomas Middleton*: We have heard from the Irrigation Department that they spend a considerable sum on the water-ways of Bengal; are these water-ways of special importance to the jute industry?—They are absolutely essential.

21608. Is the carrying of the jute from the villages to the railways mainly done by water-ways?—As a general rule; wherever there is a water-way on any railway, it is a road; therefore, if any railway system is in the water-way naturally that is used to carry on the stuff to that system.

21609. Are there water-ways which carry jute from the producing districts right into Calcutta for example?—Yes, we have that.

21610. Is this mode of conveyance used largely?—I do not think it is used as much as it has been; there is only a very small proportion of it now.

21611. Are the commercial community which handle jute satisfied with the facilities offered by the water-ways and with the work which the Irrigation Department is doing for them?—We have individual grumbles here and there. Up in

Elashin, which is a very big pressing centre on this side of the Brahmaputra, and where there are ten or twelve pressing firms exporting, *char* has formed up in front of the godowns, and that is delaying the export; the Government were approached on the point, but they said they could not do anything.

21612. My object was to get some sort of idea whether these complaints were frequent or not frequent?—I should not say that they are frequent.

21613. They are not of special importance?—Every year you may have individual instances, but as a general rule they are not of special importance.

21614. The water-ways are serving you satisfactorily?—Yes.

21615. You expressed the view that because of the deposit of silt, jute soils are not deteriorating: do I interpret your answer correctly?—I did not actually say that it was not deteriorating. I said there was no necessity for fertilisers.

21616. From your long experience, can you say whether there have been any indications of deterioration?—I do not think so.

21617. At any rate, deterioration cannot be proceeding at a rapid rate?—I do not think it is.

21618. From your answers on the question of stocks, I infer that the market for jute is not an elastic market. It is a narrow market, and you stated, I think, that the demand from year to year varied from something like 90 lakhs of bales to 108 lakhs of bales?—This year I said the crop was 108, but 90 lakhs is the normal consumption of the raw material.

21619. Whenever you get a slight over-production, there is immediately a very heavy drop in prices?—I would put it rather differently. For the actual amount which is consumed, it is necessary to maintain what the manufacturers would call satisfactory stocks, that is to say, a stock which will not force them into the market at an unfortunate time. Anything over and above that will certainly cause a heavy drop in prices, for the reason that 10 lakhs of bales is not necessary for the manufacturers' market, unless he buys it cheap as a speculation; he does not want it.

21620. The market is not an elastic one?—No, not in that sense.

21621. With reference to the subject of statistics, you say that the Agricultural Department claim to estimate the yield fairly successfully by tests of crops. I think you are aware that the making of these estimates is very difficult work?—It is very difficult.

21622. I was going to ask you whether the estimates of yield which are provided for you at present give a reasonable degree of satisfaction?—I think I would like to explain what I mean by yield; I mean the actual yield of the crop taken from the field. I am not talking about the acreage or about the extent of sowing. I am talking purely and simply of the actual crop taken off the field and tested in comparison with fibre, in terms of fibre produced. From what I know, the Agricultural Department carries out very extensive tests and quite satisfactorily, as far as the actual yield of the fibre from the jute is concerned. Provided they recorded it correctly when the test is being taken, there is no reason why it should not be absolutely correct.

21623. You know that difficulties have been created in the past by the backward condition of the cadastral survey?—Yes.

21624. That survey is now approaching completion?—Yes.

21625. Do you anticipate that when the Agricultural Department have the exact figures at their disposal, the present methods of estimating the yield are likely to be satisfactory?—Yes, if they have the money to pay for the staff; finance is one of the rocks, of course.

21626. *Dr. Hyder*: I would like you to tell me something about the Calcutta side of the jute market. I understand from your answers that in the organisation there is the cultivator who sells at the *hâts* to small *beparis*, the small *beparis* sell to the bigger *beparis* and the bigger *beparis* then sell to the balers upcountry. I should like to know what happens to the jute when it gets into the hands of the larger *beparis* and the balers?—The larger *bepari*, if he is advanced money by a firm of balers, has to go to the godown of that firm because he has got a loan. If he is advanced money by an *aratdar* then he has got to go to the *aratdar's* office to take his instructions as to where he has to take his jute for sale.

21627. This jute when it arrives in Calcutta gets into the godowns of *aratdars* or wherever the godowns may be?—When you talk about the Calcutta bazaar, you are getting on an entirely different side.

21628. I want you to correct me. Let us say, Narayanganj. I understand that at Narayanganj you have got these *aratdars*. Are they Marwaris?—No, they are Bengali *aratdars*.

21629. What happens to the jute when it goes from the godown of an *aratdar*?—There is a special import shed for it.

21630. I should like to know what happens to the jute when it goes into the hands of the firm of balers or whatever it may be called?—I will give you the exact process it goes through. It is landed in an import shed, then it is priced according to the market price, then it is weighed and put into the assorting sheds. It is then assorted into grades and in due course baled and shipped and it then arrives in Calcutta. That is the whole process from start to finish.

21631. Where do you come in?—I am a broker. If the upcountry baler wants me to sell his jute, he gives me his offer through his head in Calcutta and when I sell his jute he has got to ship it.

21632. *Professor Gangulee*: Is this *aratdar* a commission agent or a broker?—The broker of the loose jute upcountry is entirely separate.

21633. Who is the broker in the jute market?—I should say the jute broker is the man who prices the jute in the import sheds of the balers.

21634. *Dr. Hyder*: This is the trade side of the jute business. I should like you to tell me something about the speculative side also. How and where does that influence the market?—If there is a big speculation, it affects the minds of the sellers of the actual material. If the market is firm and rising the seller of the bales of jute generally hopes by holding the produce to have a higher market.

21635. Please tell me what proportion of the selling you control and what proportion is not under the control of the Calcutta Jute Dealers' Association?—I should think that the Calcutta Jute Dealers' Association include people who sell their own jute like the big Europeans. I suppose in a normal year their share will come to a little less than half. When you come to the total crop, it is just about one-fourth of it.

21636. Let us keep our eyes fixed on the 55 lakhs of bales. I want to know what proportion of this total of 55 lakhs does the Calcutta Jute Dealers' Association control?—I should estimate about 25 lakhs but it is quite impossible to give you the exact figure.

21637. Who controls the rest?—The rest, which is about 30 lakhs of bales, must be done by the big European balers.

21638. They sell direct to the mills?—Yes, through their own offices.

21639. There is no direct selling by any associations or body of cultivators to the mills instead of to the balers upcountry in Narayanganj or Chandpur?—No.

21640. I would like you to tell me something about freights. You say you are prepared to give information orally about freights, sea freights as well as river freights. Let us first take sea freights. Are you aware that all the shipping companies which touch the port of Calcutta have an understanding amongst themselves as to freights?—I am afraid you are getting out of my line altogether. I said rates of freights connected with the selling of produce.

21641. Let us keep to the rates of freights between Narayanganj and the Calcutta jute mills on the bank of the Hooghli. Is the whole of this water transport or partly by water and partly by rail?—There is railway transport and steamer transport combined. There is the railway transport from Goalundo then there is shipment right down to Calcutta in flats, which are towed by steamers.

21642. How many companies are there which do this business of transport of jute on the rivers of Bengal?—There are four companies.

21643. Do I understand that there is any combination among these or have they got varying rates?—They have got more or less fixed rates.

21644. You say that there is very little which the people in Bengal do not know about the state of jute prices?—I do not think I have said that.

21645. On page 273 of your note you say, " There is very little that the people engaged in agricultural pursuits upcountry do not know about markets. Even

the state of the London Jute market is known in the villages in Bengal "?—That is one part.

21646. Do you think they take advantage of their knowledge? It may be that they are in possession of the knowledge, but they may not be in a position to take advantage of it?—They must be taking advantage according to their own economic condition.

21647. Do I understand that fluctuations are numerous but that they are not large or violent? Is that the position?—I would not say that. What I said was that you can have very violent fluctuations in a very short time. This year the market is fluctuating very very little for weeks and weeks. Last year it fluctuated so violently on two or three occasions during a fortnight that it brought down the bale to the extent of Rs. 5 within an hour and a half.

21648. Please tell me something about the supply of jute to the mills. Is it a continuous supply, or do they buy once for all for the year, or is it by means of forward sales?—The mill buys its jute on contract and it naturally buys according to its own view as to what the market is and also according to the sale of its manufactured goods. The firm has its manufactured goods in one book and the raw material in another book and it buys jute according to that book. They are buying for eight months in the year. They may buy some quantity of jute at one period of the year and a big quantity at another period of the year. Sometimes they sit out for two months and do not buy even a bale.

21649. *Mr. Gupta*: You said that as the majority of the land for jute is covered by silt deposits, it is not very necessary to have recourse to artificial means of fertilisation of that land. Do you think about half of the land under jute cultivation is covered by silt?—I should say more than half.

21650. But for the rest, I suppose artificial manuring is very necessary?—I really would not give an opinion about that because you know the difference between low land, middle land, and high land in Bengal. The high land, as you know, is not very high.

21651. It is a very important question. Do you think the land which is producing jute year after year requires any artificial manuring or not?—I should say jute is a very exhausting crop and therefore if it is sown on land which is not manured by silt, then an artificial manure of some description would be very beneficial and necessary.

21652. For instance, Northern Bengal is covered by silt but this is not the case everywhere?—It is also the case in Lower Bengal and practically the whole of Eastern Bengal.

21653. Even in the case of those tracts which are covered by inundations and silt all that is required is not obtained, nitrogen, for example, which is very essential?—I do not know the analysis of silt at all, but I know it is very beneficial for the jute plant.

21654. If there are some elements not brought by silt, it is necessary to replace them artificially by cowdung, hyacinth or something like that?—Yes.

21655. You calculate at 25 per cent. the percentage of profit which goes into the pockets of the middlemen. Is that only for the handling of the jute, or does it include interest on borrowed money, where the cultivators borrow?—It would include everything down to the actual seller of the jute in the village, the ryot.

21656. *The Chairman*: Everything for trading, but not for cultivating as well?—Purely for trading, from start to finish.

21657. But not borrowing for cultivating?—No, nothing of that sort.

21658. *Mr. Gupta*: You think, therefore, that this co-operative organisation, which will probably do away with some of these intermediate channels of profit, will be a very valuable movement in Bengal?—I think it is.

21659. And from what you know of it you think it has come to stay?—Yes.

21660. *The Raja of Parlakimedi*: On page 272 of your note you say, "I consider that each Province should have a complete expert scientific staff of its own." Do you suggest they should be independent of the central body?—No, not altogether. They should be independent to a certain extent. My idea of the central body is that it should be a co-ordinating body for the provincial bodies, but the latter should have power to deal with their own affairs.

Mr. G. Morgan.

21661. But the various provincial bodies should be in touch with each other and with the central body?—Yes.

21662. You do not want each of them to be isolated; they should exchange ideas?—Yes, and carrying on correspondence with each other, but the actual provincial work should be done by the provincial staff.

21663. Would you not welcome periodic conferences of the research workers of the different Provinces?—I think that would be very useful. A five minutes' exchange of views would save a year of correspondence!

The Chairman: They do not make paper out of jute, do they?

21664. *The Raja of Parlakimedi*: As regards meteorological work, do you not think the public should be more in touch with that?—We find it is quite good so far as Bengal is concerned. They have now put up warning signals in various places which did not exist 15 or 20 years ago. Telegrams are issued, and most people know now about cyclones, storms and so on. I have no complaint to make against it at all.

21665. Calcutta may be in touch with the work, but what about the rural districts?—I am speaking about the centres in Bengal, not of Calcutta only. The centres get the information, and it is their business to distribute it; you cannot have a semaphore in every village. You would never get the money for that.

21666. The districts are in touch with the work?—Yes.

21667. Do the districts publish that sort of information in the vernacular?—I cannot say.

21668. On page 273 you refer to the growing of fodder. Would it be as a rotation crop or what?—It would have to be a rotation crop. You cannot touch land which is under paddy, but when there is a certain amount of land vacant (there may be vacant land in the high lands during the rains, but in the low lands there is always vacant land in the hot and cold weather) it should be utilised; but it is a question of manuring and irrigation. When the rivers are almost dry we have miles and miles of land without any water at all, and all cracked. You cannot grow anything there at all unless you can irrigate it. The question is whether it is worth while to have irrigation for one crop for a few months only, because after that the rain comes and in grow the paddy and jute. I only put that forward as a suggestion for the consideration of the Agricultural Department. Fodder is practically *non est* here, except for paddy straw and *kalai*.

21669. *Sir James MacKenna*: Have you any experience of the improved varieties of jute evolved by Mr. Finlow?—I have no actual practical experience of them. I have seen various fibres brought down to Calcutta at various times with all sorts of numbers on them, but so far as that side of the work is concerned it is practically left entirely to the Agricultural Department to evolve something which will suit the trade and give us a good weighted and clean fibre jute. My personal experience of seed is that when you have got the seed growing on a certain farm and you bring it to another part where the soil level and the condition of the soil are different it goes back, at any rate in the second year, to the sort of seed that was there already. I would urge the analysis of soils more than anything except the testing of seed; I think it essential that soil analyses should be taken in hand and widely published.

21670. As a basis for the introduction of improved seed, which would also have to be tested under the conditions of soil necessary?—Exactly.

21671. It cannot be easily transported from one place to another?—No.

21672. You cannot say to what extent this improved seed has improved the general quality of the crop?—No, this is too early a stage. A lot of people say it has, and some say it has not. Some villagers say it reverts to type, and that it is no use buying Government seed because it reverts to the type they had themselves. It is a matter for the Agricultural Department.

21673. I take it you lay great emphasis on the importance of detailed soil surveys?—Yes.

21674. And on the retention and appointment of fibre experts?—Yes.

21675. *Professor Gangulee*: You have just referred to the question of seed and the quality of the jute. Is there any difference in the quality of the jute taken

by the Dundee as compared with the Calcutta mills?—They buy mostly Northern Bengal jute, and not very much from Eastern Bengal. The export jute trade is mostly carried on in soft fibre jute.

21676. What about the Calcutta mills?—They prefer the harder jute for their spinning. They buy practically the whole of the jute from Eastern Bengal.

21677. Are these improved varieties we hear so much about favoured by the Dundee or the Calcutta mills?—To tell the truth, we cannot trace them individually. I have seen the stuff, and I have seen sacks made from the improved jute, and they looked very nice; but in the general buying we cannot trace it.

You cannot see the distinction?—No; it all gets mixed up.

21678. *Rai Bahadur Bannerji*: There is not enough of this new variety yet?—It is not distinct enough district by district. If a whole district grew it, we should know everything shipped from a certain place was a certain seed, but there is nothing like that. There is a field here and a field there; and all the stuff gets mixed up.

21679. *Professor Gangulee*: In the event of our getting the improved seed unmixed, would that sort of quality be good for the trade?—I cannot say. There has been no objection taken to it as far as I know at present, but I think it would be more suitable for the mills than for export. I do not think it is soft enough for exporting.

21680. Has the yield of jute per unit of area increased?—It is just about the same, so far as the figures are concerned.

21681. What is your general impression?—I do not think the average has increased; there may have been increases in individual cases.

21682. We occasionally hear something about normal yield. What do you consider to be normal yield?—It depends on the district. We take it roughly as 3 bales to the acre; I think the Agricultural Department takes it as 2¾ to 3½. The weight of the fibre varies district by district. If you have the same quantity of fibre from two different areas, you may have two very different weights.

21683. Quite. Do you realise the importance of carrying out experiments in retting?—Yes. I have tried decorticating machinery, but that was no use at all. The whole question with retting is the water. Some districts get plenty of water, because they have canals and rivers; others are in difficulties when they do not get an adequate rainfall. It might not be so difficult if the villagers could only get the land. It is all very well to say a village should start a co-operative society to cut this and that, but you have to be quite sure they are entitled to cut it, which may not be the case under the Bengal Tenancy Act. I am not in a position to say; that must be investigated before one says definitely they should combine to do this. Steeping pits for the retting of jute are essential to enable the ryot to get his stuff away step by step. This year he could not do that, and it was too long in the field.

21684. One question with regard to demand. Are any serious efforts being made in jute-importing countries to find substitutes for jute?—I do not think so. We have heard of paper bags and things like that, but we have never seen any signs of serious competition in the market.

21685. The Americans are said to be using cotton waste for bags?—That is what we call bluff.

21686. Is the extension of cultivation in the Argentine serious?—No.

21687. With regard to the jute forecast, at what time of the year is it issued?—The first comes out about July 15, and the second (which is the first to give the acreage) between September 15 and 20; it was a little later this year.

21688. The trade people are satisfied with the private forecast they get?—I do not know whether I ought to discuss that just now, because I belong to the Jute Forecast Committee, and we have had an interview with the Agricultural Department and are going into the figures; but as a matter of fact in some cases the margin of difference has been more than it should be, and we hope in future it will be lessened owing to the new way in which the figures are to be collected.

21689. Considerable time is devoted to the jute forecast by the Department of Agriculture. What is the effect of an inaccurate forecast on the trade?—Long before Mr. Finlow brings out his preliminary figures, practically all over

the districts we have got jute growing well, and we get our own idea from private sources of what the crop is going to be. If the Government publishes a forecast very divergent to what the trade has made it out to be, then it will be creating a bear or a bull market which as you know causes fluctuations. That is the position.

21690. It has been alleged that jute forecasts have been a very disturbing factor in the market so far as the cultivators are concerned?—That I could not say.

21691. That is the allegation we often hear?—If the figures published create a bear market, then the cultivator will get less than he otherwise would have got; if they create a bull market, he would be getting more than under the ordinary circumstances. You may take it that way.

21692. What is the market season for jute?—We begin exporting from the mofussil about the middle of July. Before that of course there is a certain amount of jute accumulated in the balers' godowns. The balers have to keep a stock before they begin baling; it would not pay them to bale for a day and stop work the next day.

21693. You have two channels through which you obtain your jute, one private, *i.e.*, your own mofussil centres, and the other a broker. Am I right? You buy a certain amount of jute direct from the brokers?—Do you mean "balers"? Balers and brokers are very different people.

21694. I am referring to the broker?—You mean the Calcutta broker?

21695. The mofussil broker?—The broker in the mofussil is merely a man who puts his hand under a cloth and arranges the price.

21696. Who is the man who comes in immediate contact with the cultivator?—The *faria* or *paikar*; he goes to each village.

21697. Can you call the *faria* a broker?—I have always considered him a petty broker. He may have an advance from some one, we have no knowledge of these ramifications, some advance from a *bepari*.

21698. *The Chairman*: You say that you can never fathom the ramifications of the marketing agent. That being the case, do you not think a survey of the marketing of jute from the cultivator to the mill might be very well carried out?—I am sorry if any of my answers led you to believe that you could not fathom the marketing agent. If there were ten *paikars* working, and they had all received advances from merchants, it is very difficult to find out from whom a *paikar* had received an advance. He might tell you if it suited him; he would not if it did not suit him.

21699. *Professor Gangulee*: Have you come in contact with *farias*?—I have for over twenty years.

21700. The *faria* is the man who comes in immediate contact with the jute cultivator?—Yes.

21701. Let us find out the relation of the *faria* with the next man. Is the *faria* in touch with the broker or the *bepari*?—The *bepari*.

21702. He is not at all connected with any organised trade?—No.

21703. Do you know whether these *farias* advance a quarter of the price to the cultivators?—I do not know whether the *faria* advances money or not; I doubt it.

21704. Do you know what brokerage is charged by the *faria*?—No.

21705. Can you give us an idea of the time required for the transaction, from the time of selling jute to the *farias* to the time when payment is made by the *farias* to the cultivator?—I do not know that; I do not know when they pass their money at all.

21706. Do you mean when they actually pay for the jute they receive from the villager?—Yes. That was my knowledge of the Kushtia market. They pay one-third of the cost when the transaction is made, and two-thirds after they collect the money.

21707. Is there a practice of mixing sand and water?—It is a very bad custom, but it is not universal. If you get high prices you get wet jute. That always happens. Some sand comes in drummed jute from Western Bengal.

21708. Is there a great deal of variation as regards standards of weight from district to district?—Yes; a seer is sometimes 60 *sicca*, sometimes 90 *sicca*, sometimes 84 *sicca* and so on.

21709. There are wide divergences?—Yes, wide divergences.

21710. Do you think some sort of standardisation is possible?—I would not like to say that it is quite possible, but it is worth trying.

21711. What is the percentage of jute purchased by the mills in Calcutta?—55 to 35.

21712. *Rai Bahadur Bannerji*: What happens to the remaining 10?—I did not say 55 per cent. and 35 per cent. I said 55 lakhs of bales and 35 lakhs of bales. The total consumption is 90 lakhs of bales.

21713. *Professor Gangulee*: Is it possible to regulate the production of jute by better dissemination of market intelligence?—Only that one point I mentioned might be utilised. In January, before they begin to plough, you might let them know that the jute mills ar holding so much jute and that it is not worth while producing 110 lakhs of bales.

21714. Is there any system of collecting market information for the benefit of both consumers and producers?—We have no system.

21715. Is there any systematic jute forecast?—We have no system.

21716. You say here "Even the state of the London jute market is known in the villages in Bengal"?—I thought you were talking about the Government Department of Agriculture disseminating knowledge. We have hundreds of people in Calcutta who wire out information through the whole of Eastern Bengal, Western Bengal and Assam.

21717. Those are individual efforts?—Yes.

21718. But there is no organised effort?—No.

21719. Do you think that the combination of buyers that we find in the mofussil areas is responsible to a considerable degree for the unremunerative prices often obtained by the jute growers?—I have never heard of a combination.

21720. We hear of buyers from different groups of jute merchants joining hands and dictating their rates?—I have never heard of it; I have never seen it.

21721. Do you know whether any landlord of jute areas takes part in the sale of the jute of his tenants?—No.

21722. In the event of his getting all the information we are capable of giving him with regard to marketing, do you consider that the jute cultivator is in a position to hold up the jute?—No.

21723. He is not in a position even if he knew that the market was bearish?—That would depend on his monetary condition at that particular time. But generally he will have to sell a certain portion before the October *kist* comes in, there is no doubt about that.

21724. You referred to the jute speculators and their transactions. Do you not think the jute forecast would be of great assistance to them?—It would be a counter in the game of course.

21725. Would this forecast be of great help to the jute millowners?—What we want is an authoritative forecast of a crop for which we have nothing to guide us except private information. Further we want it as nearly correct as possible.

21726. You said that the co-operative marketing of jute is in its infancy. But you say they sold 20 lakhs of maunds of jute?—Twenty lakhs of rupees worth of jute.

21727. Are you aware of such transactions being passed through co-operative markets?—I do the broking for three of the places. As far as our balers are concerned, we have sold on their instructions jute of the value of something about 18 or 20 lakhs of rupees.

21728. So that, co-operative marketing is growing?—It is bound to grow if the organisation is extended.

21729. What is the attitude of your association towards this system of co-operative marketing?—If their business is going to affect you, it will be one of antagonism, but if it is not going to affect you, your attitude will be one of pure sympathy.

21730. *Mr. Calvert*: You give some reasons for agricultural indebtedness on page 272. One of the reasons advanced for increase in rural indebtedness is the

increasing amount of money in the hands of moneylenders seeking investment. Do you find that Calcutta competes for capital with moneylending at all?—You mean in the rural areas?

21731. Yes. You have a huge market for capital?—All these firms send their own money from here.

21732 Upcountry?—Yes.

21733. Is much capital from the rural tracts of Bengal being invested in Calcutta?—That I am not in a position to say.

21734. There is a large amount of Punjab capital coming here?—I do not know that.

21735. Have you any reasons to give us why capital is so readily invested in moneylending and so very sparsely invested in agricultural improvement?—Agricultural improvement is a very difficult thing. I have already mentioned something about the ownership of land. I might be sitting in Calcutta and be the owner of a one anna share, two anna share or three anna share in one estate, and it does not interest me to find out whether the estate is improving. I want to get money out of that; it is after all a rent-collecting system. People go into the courts and buy shares in an estate at an auction. They do not know where the particular land is. It is only a one anna share, a *cowrie* share and so on; it simply means you are entitled to so many rupees or annas out of the total rent collected.

21736. From the landlord's point of view, rent is the chief produce?—Yes.

21737. You said, I think, that the consumption of jute was stable?—Yes.

21738. Do you mean it is not increasing?—No, it is not increasing to any extent. Of course, it has increased enormously in the last thirty years, but you may take it that now, as far as it is humanly possible to predict, it is more or less stationary, and it will not increase unless there is a very big increase of population all over the world.

21739. Is jute a commodity of which the consumption responds readily to difference in prices?—If the prices are too high, there is no doubt about it that the people use the same thing over and over again, if they can. But that is not always possible, because jute is a thing which has got fluff on it, and they do not like to use it again if it gets dirty. It does respond to a certain extent, and the cheaper the jute manufactures are the better and wider markets they get and there is a more general use for their goods.

21740. The point is the effect of any improved type of jute which might yield 20 per cent. more than the average now obtained: would that 20 per cent. extra, assuming that the area remains constant, have the effect of bringing down prices?—Certainly.

21741. And the cultivator might lose instead of getting any additional profit?—It would not do him any good at all.

21742. Unless he restricted his area?—Yes.

21743. So the only advantage he would get would be a little more area on which to grow other crops?—Yes, if he could: it is not always possible, unfortunately.

21744. What amount of any new type of jute would be required to get separate treatment? About 10,000 maunds?—You mean in the actual area?

21745. What amount of any new type of jute would have to be handed over to any manufacturer in order to ensure separate treatment in the mill?—They would not do it: the whole art of manufacture is the batching of your various qualities, compatible with the strength of the spin; they would not spin anything separately.

21746. Not in a large quantity?—No.

21747. Is there any difficulty in getting a premium for a better type of jute?—There is always a higher price for a better class of jute, provided it has the strength and elasticity for pulling through the soft fibres.

21748. In our co-operative marketing of wheat, big people like Ralli Bros. will not look at any amount less than about 10,000 maunds: for 10,000 maunds of better wheat, they will give a special price. Is not there anything corresponding to that in jute?—Of course there is; but the different kinds of fibres are

graded; I may want 25 per cent. of the first kind, 50 per cent. of the second and 25 per cent. of the third, so that the average price spread over the three varieties will be Rs. 12-8-0. That must depend also on the quantity offered and not quality alone.

21749. There is no difficulty in getting a premium for an improved type of jute?—I would not say improved jute altogether: the question is whether the mill can utilise the improved type in the class of goods it is making; in the ordinary Hessians and sacks they use a certain percentage of good Eastern Bengal type of jute under which of course this improved type comes, but it does not oust it by any means. I would not give *kakia bombai* for what we call *assal* at any time.

21750. I wanted to prove the possibilities of a type of jute with bigger yield in the matter of prices?—On the same acreage?

21751. For improved quality, you could not possibly get a premium?—It depends on the market.

21752. *Mr. Kamat*: In this chain of middlemen, I should like to ask you whether you can suggest any means by which it is possible, if it is possible at all, to eliminate some middlemen, say one or two?—To actually eliminate him altogether?

21753. Certainly. I am asking you the question, because in the case of cotton and sugarcane, there are not so many middlemen as you have in the jute trade here?—One of the causes of the jute trade having so many middlemen is that the transport difficulties in the way of getting jute from the village are very considerable. In Eastern Bengal, in the rains these villages are small places divided by water one from the other. If the *bepari* wants 500 maunds of jute, he has to go up to the edge of a small paddy field in order to get 3 or 4 maunds from the village, and then go to another place and get another lot of 3, 4, or 10 maunds and so on; for every lot of a few maunds, he has to go 3 or 4 miles, and this he cannot do. These *paikars* go about in small boats; they collect 5 maunds from one place, 3 maunds from another, and 10 maunds from another, and ultimately go to a big village where the *bepari's* boat is anchored. In the second stage, the *bepari* brings his lot of 500 maunds to a big centre; you cannot eliminate either of them, unless there are railways. The Mymensingh jute, for instance, comes by rail, but when you go to Eastern Bengal, where the big rivers are the roadways, you have got to depend on the *paikar* to bring the material.

21754. If your communications were better, the cultivator would take his produce straight to the *aratdar* without the middleman?—I would not say that, because when you talk of improving communications you have to consider a lot of other things. I consider that, in Eastern Bengal, the water-ways are the best. If you *bunded* up Eastern Bengal with railways, you would kill the whole of the cultivators, because they would get 6 feet of water more than they get at present, on account of the bunding up; you must remember that the water there travels from north to south.

21755. When, therefore, there is the inherent difficulty of transport, I should like to know whether the co-operative societies could help the problem much?—As I said, they would help it in this way; they could bring the whole of the transport into the co-operative system, and all that money which is going from one place to another would be in their own society, and no outsider would be able to hold them up in a bad market or in a good market.

21756. I should like you to make it clear how the co-operative societies would get over the inherent difficulty of transport, which must be a great difficulty?—They would not be able to get over the difficulty of transport; they can do it themselves instead of through other people.

21757. *Professor Ganqulee*: Does the *paikar* actually go to the villages or does he depend on the *hâts*?—He does both.

21758. *Mr. Kamat*: I want to ask you something about what might be called the leakage between the price ruling in the market for the time being and the actual price which the cultivator gets; how much out of that could be saved to him, if at all?—Nothing could be saved to him. Taking each step of the procedure in connection with the jute business, there would be little saved to him. What I am trying to point out is that all that money would be in one society if the actual transport is done by that society; all that money now goes into the hands of the people who are actually working on behalf of the growers.

I do not see how you can eliminate anything, except probably the *paikar* to a certain extent, because each man could take his jute to a village centre, instead of having a small man taking it for him.

21759. I want to be a little more precise on this point. We were told the other day by the Registrar of Co-operative Societies that if the market price of the jute is Rs. 3, the cultivator gets only Rs. 2, so that he is mulcted to the extent of one-third of the ruling prices which, on the total of your 90 lakhs of bales comes to a great deal of loss to the cultivator. Is it correct, that he gets one-third less than the final market price?—I would not like to say that. It all depends on the market price. The price of transport from point A to point Z does not vary as the market price does. The market price may be Rs. 20; last year it was Rs. 28: Rs. 2-8-0 off that is not the same as Rs. 2-8-0 off Rs. 7.

21760. *Professor Gangulee*: Have you any reliable guide to go by for getting the prices in the mofussil and the prices in Calcutta?—We have enquiries made by our agents upcountry. We are always collecting statistics and information; I have not seen any Government figures.

21761. *Mr. Kamat*: Taking all these statements together, let us see where we are led to. In the first place, so far as fluctuations are concerned, all the cables you receive from London here, are transmitted by various private merchants and brokers to their agents in the villages?—I would not say that. I did not say that all the London telegrams were transmitted; I say that they know the state of the London market; Reuter's telegrams are public telegrams, and they give the information.

21762. Who sends the telegram is not the point. The information which you receive in Calcutta is not unknown to the growers?—It is not unknown to all the centres where jute business is carried on in the mofussil; they must ultimately get down to the bigger villages.

21763. Your statement is that even the state of the London jute market is known in the villages in Bengal?—Yes, and I will tell you why; when I was in a village in the Faridpur district, I was astonished that the man could tell me what Reuter's telegrams said, and what the Bhitar Bazar quotations were.

21764. My own experience is that it is only along railway centres, in big places like, say, Narayanganj that they know what the market is in Bombay or Calcutta, but you say the information goes down to the villages?—They get the information through the *beparis* in time; I do not say that they get it at that particular moment; we have not got wires enough for that.

21765. Is it to the interest either of the *beparis* or of the brokers in Calcutta to immediately communicate to the villages the fluctuations in prices?—I do not think there would be any objection.

21766. Would you do it?—How can you do it?

21767. Nobody can do it?—How can you do it?

21768. Should not some such system as Sir Ganga Ram proposed, that the ruling market prices should be telegraphed to as many centres as possible in the interior, be brought into force?—There is no objection whatever to it.

21769. It would not affect either the brokers or the buyers in Calcutta?—There is no reason why it should.

21770. *Professor Gangulee*: Is it done?—The Marwari knows everything; all the European agents get the telegrams.

21771. *Mr. Kamat*: They wire it for their own interest?—How do you mean? Suppose there is bull market and you are a buyer, you have got to wire the information every day.

21772. If I know that the Calcutta market is likely to rise, I ask the man to buy a certain quantity, but that telegram does not help the cultivator?—I do not say it is absolutely possible to give information about every single forecast.

21773. I never say in my telegram that the market is rising, I simply send a code word, and the man understands. Am I right?—That is not exactly what I mean. If the official department did it, they would do it in an impartial manner.

21774. I want to know whether that could be done in this Presidency?—I would not like to say that because distances, communications and everything else are

so enormous that you would have to be very careful that you did give the information to one lot of people and the other lot of people did not get it. That would be most unfair.

21775. Would not some such system be practicable?—I would not even say that, I do not consider that anything is not practical. I say that it requires investigation before deciding whether it is feasible or not. I do not see why it should not be feasible.

21776. Supposing the Director of Agriculture telegraphs to every village where there is a post office and puts up in the post office a notification that the rate is so and so, how would that work?—It would work all right as far as that is concerned.

21777. Would all merchants welcome it?—If it suited their book, they would welcome it.

21778. With regard to speculation in jute in the Calcutta market. When the people form a ring to push up the prices, do the brokers or the brokers' firms join in the ring?—There is no such thing as a ring.

21779. You do not form rings here to push up the prices?—No.

21780. *Professor Gangulee* : Even among the jute millowners there is no ring?—Not that I know of.

21781. *Mr. Kamat* : A question or two about the jute cess. You know the export jute cess. May I know how much that is?—It is so much per bale and it is so much on manufactured jute per ton. It comes to about 3 crores of rupees.

21782. Could you tell me how much it is per bale?—I think it is Rs. 4-8-0 per bale but I am not certain about it.

21783. Supposing this present cess were enhanced a little bit, would you as a man in the trade tell me whether the consumer would feel the burden?—That depends on the position of the market. Your market position to-day is such that the cultivator, the man who grows the jute, is bound to feel it because there is a lot of jute which is unsaleable except at a particular price. If you could get higher prices for their crop and a keen demand then if you put on a little it will not affect them much.

21784. Taking the present price at, say, about Rs. 10, I am not talking of Rs. 30, would it be fair to increase the cess?—I do not think they should put anything on the ten-rupee basis. It would not be fair.

21785. *Sir Henry Lawrence* : What is the present percentage value?—It is Rs. 55 a bale and Rs. 4-8-0 a bale duty. The price is Rs. 55 f. o. b. That reduces it nearly by 8 annas a maund.

21786. *Rai Bahadur Bannerji* : I will tell you something about my experience of this *kakia bombai* variety of jute and the feeling about it in the country. Last year I went to have a look round at a certain farm and I found on about 5 acres of land they were growing this *kakia* jute in the district of Hooghli. Side by side, they had the country variety with red stems. This *kakia* was at least 3 feet taller than the other variety. I was talking with the cultivators and they said that they had a feeling that not only would this *kakia bombai* give them a better yield in quantity but also in quality. Do you think this feeling is correct?—According to all the statistics that we have had with regard to *kakia bombai*, there is no doubt that it will give a better yield. In regard to quality, it is doubtful whether it is not of a slightly brittle nature. I do not think consumers have quite made up their mind on that point yet. But there is a suggestion that if everything was *kakia bombai*, they would not get the spin of the manufacturers satisfactorily. I have seen one spin but that is all I saw of it. I have never seen the actual results but they certainly thought that it was too brittle on the spin.

21787. Perhaps it is too early yet to say what the nature of the quality of *kakia bombai* is going to be?—I really do not know. The Agricultural Department are the people who are in a position to give detailed information on quality and fibre and so on. Mr. Finlow has got that at his finger's ends. What we know is this that if you are going to have the same acreage and increase your percentage by 20 per cent. then you are going to knock down the prices.

21788. If jute has brought some prosperity to Bengal, has not it also brought malaria along with it?—I have lived in the jute districts for 22 years and I have

smelt all kinds of smells connected with jute and I have never suffered from malaria.

21789. Europeans do not generally suffer because their style of living is quite different and they take preventive measures which the Indian do not and cannot take?—If you are going to live in water as the people in Eastern Bengal do, you are sure to get malaria even if you live in a *pucca* house. The people of Eastern Bengal will always have malaria because they practically live in water.

21790. So it is quite independent of the steeping of jute?—The steeping of jute has not harmed them in any way.

21791. *Dr. Hyder* : You said that the difference between the price of jute paid to the grower and the actual price was Rs. 2-8-0. I ask you how much out of this Rs. 2-8-0 represents the cost of carriage on the average?—You mean carriage from the baler to Calcutta mills. I was talking of right from the village up to the jetties. Mind you, every boat has got its own rates.

21792. Let us get these things clear, whatever the quantity may be, how much would be the cost of carriage so that we may have some idea of the total amount available for the dealers in jute?—I do not know what it exactly comes to, but I suppose it is 4 annas a maund overhead. You have got to go from Siliguri to Calcutta by railway; then you have got a combined service. They are all varying rates of freight.

21793. Have not the manufacturers of jute got their own agents just as cotton people have their own agents?—Some of the mills have got upcountry agents.

21794. How many grades are recognised in the trade?—The trade recognises four grades. That is the real grading of jute.

21795. Please tell me how many maunds would a baler require to keep his plant going?—If he has got a *kutcha* press, he would want about 700 maunds a day. To find out his total requirement you can multiply it by the number of presses he is in a position to put up.

21796. With regard to the question of the improvement of jute, do I understand that you are of opinion that any increase in the production of improved seeds would simply mean a curtailment of the area? What about getting an increased outturn and devoting the area so set free to the cultivation of food crops and fodder crops?—What I said was this that if they are going to get any fibre which the Agricultural Department might evolve then they are going to get 20 per cent. increase in the outturn.

21797. Has any attempt been made by the Government or by other non-official people in the Bengal Legislative Council to control the gambling operations in the jute trade?—A Bill was withdrawn; that is all that has been done.

21798. You have not proceeded beyond that?—No.

21799. *Sir Henry Lawrence* : Have you any special view as to the manner in which Government can assist the jute cultivators in their prosperity?—The main thing is finance. If he can get easy finance, he will be able to free himself from heavy indebtedness such as is caused by the mounting up of interest which he cannot pay. That is the real relief that is wanted, and that is why I am of opinion that if these co-operative credit societies are really worked properly and thoroughly there is no reason why the ryot should not become free, I do not say to-day or to-morrow but at sometime in the not too remote future, and become self-reliant and self-supporting through money circulating amongst their own people, provided the rates of interest are not too high and that the ryot can always get a loan when he needs it, though not for spending unproductively, and provided he put his money in when he has got it, and borrow when he has not, at a fair rate of interest.

21800. Oppression by small men to whom he is tied by debt is the greatest evil from which he suffers?—Yes, and when he does get money he spends it. Last year they must have got a lot of money, but beyond buying corrugated iron and a few things like that it seems to have been frittered away.

21801. It is said they have paid off a lot of debt?—Yes, but on the price of jute last year they must have made a lot of money.

21802. *Professor Gangulee* : What is the basis of your grading?—The top number is 70 warp, the next 50, the next 30 and last is wift pure and simple.

21803. *The Chairman* : I notice among your various activities, you are President of the Agricultural Society of India. You have been good enough to extend an invitation to the Commission to come round to your gardens, but hitherto we have not been able to fit that in owing to our programme being so overloaded. I should like to ask you, however, whether you are carrying on any economic work at the Horticultural Association gardens?—Not as regards agriculture at all; we are doing no work of that description. This society was started before there was such a thing as an Agricultural Department at all; it was founded in 1820.

21804. Do you do any fruit-growing?—Only to a small extent. That is what we want to get on to now, because there is great scope for it.

21805. You would like to undertake some experiments in horticulture?—Yes, we are doing something in a small way.

21806. Could you undertake fruit-growing experiments?—Yes.

21807. On a sufficiently large scale?—Government wanted us to take it up, but wanted to give us a garden in the middle of Bihar, which was too far away. We offered to give periodical visits and advice and so on, but they did not want that.

(The witness withdrew.)

Mr. C. M. HUTCHINSON, C.I.E., late Imperial Agricultural Bacteriologist, Calcutta

Memorandum

It is generally admitted that the development of Indian Agriculture will depend largely upon research work. I have pointed out elsewhere in my evidence that the Provincial Departments of Agriculture have been understaffed and overworked; notwithstanding this, much valuable research work has been done in the Provinces as well as at Pusa but at present owing to the loss of a large number of experienced men, the Provincial departments are not in such a good position to deal with research problems as they were formerly. The adoption of the recommendations of the Lee Commission which stopped recruitment to the Agricultural Service in England, taken together with the fact that the comparatively low rate of remuneration has failed to attract a sufficient number of the best class of Indians to the department, has militated against the progress of research in the Provincial Departments. For this reason amongst others it is all the more necessary to strengthen the position of Pusa, so that this institution may effectively fulfil one of its most valuable functions in the Department of Agriculture, namely the maintenance of a high standard of research work for the benefit of the country as a whole. This has been done in the past and should be continued in the future, partly by contact between its personnel and that of Provincial Departments to their mutual benefit, and partly by the control exercised by the Editorial Council of the Director of Pusa over the scientific memoirs of the Department of Agriculture. To the outside world of agricultural science, the Department of Agriculture in India, so far as its research work is concerned, is known through the Pusa memoirs, which record the work not only of the Pusa staff but of that of all the agricultural workers throughout India; Pusa is the Rothamsted of India and it is vitally important in the interests of Indian Agriculture that this institution should carry weight with the Central Government so that the decisions of the latter on agricultural matters should be influenced by a recognised authority. A further important function of Pusa should be to afford educational facilities to Indian research workers of such a standard as to make it unnecessary for them to go to England or elsewhere for post-graduate instruction in research methods. The present condition of affairs which leads to the resort of Indians to research institutions, such as Rothamsted, is highly unsatisfactory for many reasons. It is liable to lead to the assumption on the part of the student that because he has been to England and obtained testimonials there, he is therefore better qualified to obtain employment under Government in India than another who has had all his training in this country. As an ex-member of the Pusa staff, and one who has trained students from every Province in India, I am prepared to maintain that Pusa is better equipped to provide instruction in research work on Indian agricultural problems than any institution in England or elsewhere. It is in my opinion of the highest importance not only that the standard of research at Pusa should be maintained at its present high level, but that everything possible should be done to strengthen its position and prestige both with the Central Government and throughout the country. As a result of my experience extending over seventeen years as head of a section at Pusa, I am of opinion that the position of Pusa, and to some extent its efficiency as a research institute, has been prejudiced by the want of a Director whose whole time could be given not only to co-ordination of the work of the various sections and to the creation of a continuous policy in regard to the directions of research, but to represent agricultural science as distinct from administration. The present position in which the posts of Agricultural Adviser and Director of Pusa are doubled is unsatisfactory if only for the reason that the incumbent of this onerous position has very much more work to do than any one man can adequately carry out. Nor has the adoption of the make-shift device of a Joint Directorship done anything to improve the position, as this involves the diversion of part of the energies of a highly trained scientist into petty administrative channels with the implication that his proper sphere of action as head of a section requires only part of his time.

With regard to the educational function of Pusa, the importance of which I have mentioned above, I should like to record my opinion that the operation of this part of the work at Pusa should not be allowed to interfere with the research work of the various experts; in my experience a research worker who is

obliged to give much of his time to instruction is liable to lose value as a research worker, not only on account of the diversion of his time and energies into the educational channel, but because the attitude of mind of the teacher is fundamentally opposed to that of the humble seeker after truth. Many of our greatest scientists have no doubt been teachers, but in the majority of instances, this has been from necessity and not from aptitude or inclination, and although there have no doubt been brilliant exceptions to this rule, there can be no doubt that on the whole the addition of educational duties lowers not only the quantity but the quality of a research worker's output. For this reason I would urge the provision of an additional teaching staff at Pusa; this staff should be under the Director and should be supervised by and receive advice from the research experts.

As I have stated above, one of the prime functions of Pusa as a research institute is to set a high standard of research for India as a whole. In addition to this, it should serve as a nucleus for the co-ordination of research in Indian agriculture. The present position with regard to this important subject is unsatisfactory, in as much as the independent operations of research workers in the various Provinces are liable to lead not only to duplication of work but to loss of that higher standard of efficiency which may be attained as a result of the pooling of scientific knowledge and results. Although great variations in climate and soil are found in the country as a whole, nevertheless numerous fundamental problems connected with soil fertility and crop production arise and are suitable for investigation by capable research workers in any part of India. It is in my opinion important that the selection of these problems and the inception of research work to deal with them should not be left to the haphazard choice of experts all over the country. In the past history of the Agricultural Department much excellent and valuable work has resulted from this method but now that the virgin soil of Indian agricultural research has to some extent been brought into cultivation it becomes necessary to take stock of the situation and co-ordinate our efforts so as to make the best use of our energy and material. Probably the creation by the Government of India of an Advisory Council representative of the various Provinces would help to ensure co-ordination of research in India; in any event some such provision should be made to secure this result.

Finally I should like to point out that the unfortunate geographical position of Pusa has done much to detract from its general usefulness, not only on account of its distance in railway time from Simla and Delhi, but as reducing accessibility to the general public. It would of course be a drastic measure to scrap the present buildings and equipment and recreate it elsewhere, but I am of opinion that should the finances of Government or the generosity of a second Phipps ever admit of such a step, it should be taken unhesitatingly in the interests of Indian Agriculture.

The future prosperity of India as an agricultural country depends mainly upon the maintenance and enhancement of the productive power of the soil. This can be effected by the use of three main lines of operation :—

By the use of (1) improved methods of cultivation and improved tillage implements; (2) improved varieties of crops; and (3) fertilisers, whether indigenous or imported.

All three methods depend for their effectiveness upon adequate research work as a basis for the introduction of improved methods. As is well known, much valuable work has been done by the Agricultural Department on the first two of the above methods but, in my opinion, the importance of the third, *i.e.*, the use of fertilisers, has not received adequate recognition for various reasons of which the following may be cited as outstanding :—

1. A general tendency to assume that, owing to the poverty of the cultivator and his general condition of indebtedness, it is out of the question for him to spend money on fertilisers.

2. A similar assumption that owing to general conditions in India especially with regard to prohibitive rail freights, the use of fertilisers on field crops is not an economic proposition.

3. Absence of sufficient information to form reliable judgments as to the economic returns from the use of fertilisers.

I have no remarks to offer with regard to 1 as this subject has been dealt with by more competent witnesses, but it is clear that the institution of co-operative

credit and the various systems of Government loans serve to indicate recognition of the importance of this point.

With regard to 2, the geographical situation so far as the great distance between ports and much of the arable districts is concerned makes it necessary to take into consideration the possibility of reducing railway freights on fertilisers so far as this is compatible with economic considerations. This point has been raised by the Board of Agriculture in India on more than one occasion and the increasing importance of the question makes it all the more necessary that the attention of Government should be drawn to the subject.

3. Information as to economic returns from the use of fertilisers is naturally the basis and necessary preliminary to any attempt to introduce their use into this country, where they are at present practically unknown. The fact that such information is very generally lacking throughout the country is due to various causes. Of these, I should be inclined to say that the principal one has been the understaffing of the Departments of Agriculture in the various Provinces; the natural sources of such information would be the Deputy Directors of Agriculture, but when we come to examine their duties we find that they are so numerous and cover such disproportionately large areas of land that every excuse can be found for the paucity of information as to the economic possibilities of the use of fertilisers which they could provide. So far their principal activities have lain in the direction of the distribution and popularising of improved and higher yielding varieties of crops and of testing and recommending the use of improved implements and better methods of cultivation. As is well known, notable success has attended these efforts and it is only necessary to refer to the well known improved varieties of wheat, rice, jute, and sugarcane and the numerous improved implements in the form of ploughs, harrows and cultivators to substantiate this statement. Education has also taken large toll of the activities of the Department of Agriculture in every Province in India as a necessary fore-runner of any improvement in the general condition and agricultural efficiency of the cultivator. Numerous manurial experiments have been carried out on the Agricultural Department's farms, but inspection of the results is disappointing and leads to the general conclusion that the information so obtained is not only meagre and entirely out of proportion to the importance of the issues involved, but that much of it is valueless owing either to faulty design of the experiments or to incorrect interpretation of the results. On the other hand, results are to be found which clearly suggest that fertilisers, including artificials, can be used with economic success on a large number of crops and soils in this country; this is naturally more obvious in the case of revenue crops such as sugarcane, jute, tobacco and tea, but there is also evidence that such a widely distributed field crop as rice, which is known to require organic manures, generally as green manures, will also respond to the use of sulphate of ammonia and phosphates with economic advantage. It is therefore desirable that complete and accurate investigations should be made of the economic possibilities of the use of fertilisers and this can only be done on any sufficient scale at present by the Agricultural Departments in the various Provinces.

Some seven years ago, I expressed the opinion in a paper read before the Indian Science Congress at Bombay that the introduction into Indian agricultural practice of high-yielding varieties of crops and of improved implements of tillage rendered it necessary to make corresponding provision, to avoid depletion of soil fertility, by replacement of the extra amounts of plantfood removed from the soil by these improved crops and implments. I had come to the conclusion that, as a result of experience, the Indian cultivator had adopted a system of cultivation which deliberately aimed at securing a medium rather than a maximum crop, as his experience showed that intensive cultivation in many cases resulted in loss of fertility shown by reduction of yield in succeeding seasons. In adopting this procedure, the ryot appears to have been unconsciously recognising the existence of natural recuperative forces and adapting his agricultural methods to their rate of operation. The principal factor involved is no doubt the fixation of atmospheric nitrogen by soil bacteria which is in constant operation in all soils, but assumes a highly important rôle in India on account of the relatively high soil temperatures. The use of legumes in a rotation is of course another instance of unconscious utilisation of a similar natural process, but is probably of lesser importance so far as nitrogen supply is concerned than the asymbiotic nitrogen fixation which is in continuous operation. This latter process adds nitrogen to the soil at rates which vary not only in different soils but from season to season, and actual experience has shown that in certain soils the use of improved tillage

and higher yielding varieties of crops leads to reduction of fertility, whereas in others this effect is not apparent over considerable periods of time. This difference between soils may be due to a higher initial content of nitrogenous organic matter, or to higher rates of nitrogen fixation in the stronger soils, but in any event it is obvious that it is vital to the interests of Indian agriculture that due recognition should be accorded to the fact that improved varieties of crops and tillage implements tend to exhaust soil fertility and that it is necessary to make provision against such depletion. So far as nitrogen exhaustion is concerned, it has been the aim of the Bacteriological Section at Pusa to investigate the possibilities of enhancing the rate of natural nitrogen fixation by the use of appropriate methods of soil management; a considerable amount of useful and suggestive information has been obtained and it is to be hoped that this line of enquiry will be carried to a successful issue. Here I should like to draw attention to the importance of research in soil bacteriology which, in my opinion, has so far received inadequate recognition in this country. The science of soil bacteriology is still in a relatively early stage of development, but, although in other countries its possibilities are generally recognised, in India, where, owing to climatic conditions the relation between bacterial activities and soil fertility is abundantly obvious, work on this highly important subject has been almost entirely confined to the Bacteriological Section at Pusa. This has not been due so much to lack of recognition of its importance by the officers of the provincial departments as to lack of the funds necessary to create posts for bacteriologists. On the other hand, it has been want of conviction of the importance of the subject that has prevented the allocation of funds for this purpose; the position so far has been that various Provinces have sent assistants, generally Chemists, to Pusa to be trained in bacteriological technique, but these men on returning to their Province have worked under the Soil Chemist, and although many of them have done excellent work, yet this has been limited by reason of engaging only part of the attention of the expert in charge, who as a chemist has other duties which to him are of superior interest. In my opinion, the importance of soil bacteriology in India is sufficiently great to demand the attention and justify the appointment of experts in the subject in every Province in the country, as, until we are more fully acquainted with the vital processes in the soil upon which its fertility so closely depends, we are merely groping in the dark and cannot expect to secure that necessary foundation of ascertained facts upon which the stability of any system of scientific agriculture must depend.

As I have already pointed out, the fixation of atmospheric nitrogen by bacterial agency is one of the most important problems requiring the attention of the Soil Bacteriologist and it is hoped that further knowledge of this subject may lead to the introduction of practical measures tending to reduce the depletion of the nitrogen content of the soil; in the meantime, however, it is vitally necessary not only that provision should be made against depletion of existing soil fertility but that the general level of crop production should be raised by the use of improved methods and, so far as is economically possible, by the use of fertilisers. It may be pointed out that one of the important functions of fertilisers in India should be to increase the quantity and quality of the cattle fodder available. Apart entirely from any increase in the food and revenue crops of the country, improvement in the general condition of the cattle upon which not only the welfare of the population as affecting the milk-supply, but also the efficiency of agricultural operations themselves so largely depend, is a vital factor in determining the prosperity and well-being of the community as a whole. It is one of the outstanding and most widely recognised facts determining the condition of the agricultural population that the general state of malnutrition of their cattle lowers the efficiency of the latter both as milk producers and for draught purposes. It is this factor which tends to nullify all efforts to improve the breed of Indian cattle by hybridization or otherwise, and it is only necessary to refer to the well-known prevalence of malnutrition amongst the human population and its obvious connection with defective milk-supply, to draw attention to the important part which the use of fertilisers might play in this connection. The best method of introducing the practice of manuring for improvement of fodder crops and grazing areas would naturally be a subject for study by local Departments of Agriculture, who would also have to exercise their influence in the direction of convincing the cultivators of the ultimate economy of such an operation. This no doubt would be difficult but it is worth while placing on record an expression of opinion to the effect that this particular application of the use of fertilisers in India should form part of the future policy of the Department of Agriculture by reason of its undoubted importance to the prosperity of the country as a whole.

Mr. C. M. Hutchinson.

It is an unfortunate fact that at the present time the use of fertilisers is practically non-existent in India. This is not due to complete ignorance of their value: the *ryot* knows the value of cowdung but the scarcity of fuel which leads to the burning of cattle manure has been one of the most potent factors in keeping down the fertility of Indian soils; this was pointed out many years ago by Voelcker but his suggestion of importing firewood to remedy this defect was unfortunately an impracticable one. I have already referred to the fact that the operations of the Agricultural Department have not resulted in the use of fertilisers to any appreciable extent and have suggested reasons for this condition of affairs. It is further to be remarked that the whole position has been prejudiced by the lack of co-operation between the Agricultural Department on the one hand and the fertiliser industry on the other. The extensive and increasing use of fertilisers by the tea industry led to the creation of a fertiliser industry in India to satisfy its needs; by a natural process of trade, attempts were made to extend the sale of fertilisers to Indian cultivators as well as to European planters; unfortunately this was done at a time when information as to the manurial requirements of Indian field crops was almost wholly lacking, the consequences in many cases being disastrous to the expansion of this branch of the industry. Not only was the confidence of the cultivator forfeited but the attitude of the Agricultural Department became quite naturally, in many cases, antagonistic to the trade. At the present moment, however, a different state of affairs exists; the Provincial Departments of Agriculture are turning their attention more and more to the possibilities of the use of fertilisers not only for revenue but for field crops, whilst the fertiliser industry is consulting Officers of the Agricultural Department as to the kinds of manures required and the price which the cultivator can afford to pay for them with economic advantage. It has further been realised by the trade that fertilisers in India must come into that class of goods the sale of which can only bring in small profits. The position, therefore, now is that expansion of the use of fertilisers in India depends almost entirely upon the provision of reliable information as to the economic use of fertilisers by the cultivator. This information at present can only be supplied by the Department of Agriculture and it is upon co-operation between the officers of this department and the fertiliser industry that any expansion of the use of fertilisers in India must depend. It is for consideration in what manner this co-operation may best be effected; probably in the initial stages of development the appointment of special liaison officers between the departments and the trade would facilitate matters. At the present moment the position with regard to the use of fertilisers in India is unsatisfactory chiefly for the reason that sufficient and reliable information as to their economic utility is not available; without such information the Department of Agriculture cannot confidently recommend their use nor can the fertiliser industry make satisfactory arrangements for their supply at economic rates. Such information as is in existence in the records of the Agricultural Departments is at the disposal of the trade and much invaluable advice based on their experience is freely given by the officers of the department but at present the information is limited and this limitation serves as a check not only upon the activities of the fertiliser merchant but upon the freedom of intercourse and co-operation between the latter and the Department of Agriculture. To sum up the situation, it may be said that the introduction of improved varieties of crops and implements and methods of cultivation has as a necessary corollary the use of fertilisers to maintain soil fertility. To make this possible in this country as an economic proposition reliable information as to the proper use of manures is essential both in the interests of the cultivator and of the trader. Such information is at present in a very incomplete condition and until this state of affairs is remedied, no considerable advance in the direction of the introduction of fertilisers into general practice in this country can be expected.

Propaganda.—Critics of the agricultural situation in this country are prone to regard the Indian cultivator as hopelessly conservative in his ideas; it is of course natural that a ryot depending for his livelihood and indeed his very existence upon the success of his agricultural operations should be extremely unwilling to experiment with untried and unknown methods. On the other hand, experience has shown that the cultivator is prepared to take an active interest in any new agricultural methods which seem likely to give him an adequate return; as Sir Valentine Chirol points out, he is ignorant but not unintelligent. It is of course necessary to convince him of the practical value of innovations, generally by actual demonstration on soils similar to his in his own district; this has been the method of the Agricultural Departments for many years, and the extensive adoption of improved varieties of crops and of modern implements is the measure

and indication of the success of such propaganda. That equal success has not been attained in the direction of the use of fertilisers is due partly to the lack of information as to their economic possibilities in the possession of the agricultural officers themselves, with a consequent want of faith in their value, and partly to lack of stability in the price of manures as a result of the effect of the War during the past decade. A further factor has been the understaffing of the Agricultural Department which has made it impossible for its officers to deal with all the subjects to which their attention might have been turned with profit. As I have suggested above, this has led to comparative neglect of the fertiliser problem, so far as we can judge from the paucity of information available after twenty years' work, in favour of popularisation of improved varieties of crops and implements. This condition of affairs must be remedied if Indian agriculture is to make any advance in economic efficiency, and in my opinion the first requirement is the establishment of effective collaboration between the Department of Agriculture and the fertiliser industry. Such collaboration would be facilitated by the appointment of liaison officers between Government departments and the fertiliser industry, and as a first step in the direction of the creation of a satisfactory situation the appointment of a representative committee to examine and report upon the situation may be suggested.

Any extension and adoption of the use of fertilisers, along with improved methods of cultivation, will depend largely upon effective propaganda work throughout the country, such work must be carried out both by Government departments and by the fertiliser merchants and the measure of its success will largely depend upon co-operation between them. It would seem necessary to arouse the interest not only of the ryot but of the landholders both large and small and especially to convince the latter of the economic advantages of improved methods. Whatever means may be adopted to effect this, it may be said that co-ordinated and well-directed effect is essential to success and, as I have suggested above, the whole question could be most effectively dealt with by a special committee on which all the interests involved should be represented. Such a body would include officers of the Agricultural Department, and merchants interested in the fertiliser and agricultural industries, and should be appointed by and receive the full support of the Central Government.

Irrigation.—As a result of study of soil fertility problems in India from the bacteriological standpoint, I came to the conclusion that the utilisation of irrigation water to the best advantage depended very largely upon accurate knowledge of the relationship existing between the soil water-supply and the activities of soil bacteria. Owing to the relatively high soil temperatures in this country and the consequent rapid development and activity of soil micro-organisms, the influence of the latter upon soil fertility has a very special significance and importance in India. This influence may be good or bad and one of the most important factors in determining its direction is the management and distribution of the water-supply. In unirrigated areas control of this important factor is naturally limited but irrigation offers opportunities of providing optimal conditions, so far as water-supply is concerned with bacterial action in the soil. At present our information on this point, although considerable, is not sufficiently accurate to enable full advantage to be taken of the control over soil water-supply afforded by irrigation. We know for instance that excess of water in some soils may reduce the whole supply of nitrates present in some 48 hours and that if such conditions of water-logging persist for any length of time, fertility may be greatly reduced by the undue development of anaerobic bacteria and the deleterious by-products of their metabolism. Conversely proper regulation of the water-supply will promote the beneficial processes of nitrification and nitrogen fixation. Before making use of this knowledge in the field it will be necessary to study the subject further under irrigation conditions, and for this purpose I suggested some years ago the institution of a special laboratory for the purpose situated in a typical irrigation area. A note on this point was published in the *Agricultural Journal of India* in July 1925 and I should wish to reiterate here my opinion therein expressed that the establishment of a special laboratory in an irrigation tract for the study of the above and other problems connected with the use of irrigation water would be of very great utility and advantage to Indian agriculture.

Mr. C. M. HUTCHINSON, C.I.E., late Imperial Agricultural Bacteriologist,
and
Mr. F. E. MAURER, Manager, Fertiliser Department, Messrs. Shaw Wallace and Company, Calcutta.

Oral Evidence

21808. *The Chairman* : Mr. Hutchinson, you are late Imperial Agricultural Bacteriologist to the Government of India?—Yes.

21809. I understand it is convenient to both of you that you should appear with Mr. Maurer, who is Manager of the Fertiliser Department of Messrs. Shaw Wallace and Company?—Yes.

21810. Mr. Hutchinson, you are at present Chief Scientific Adviser to the Fertiliser Propaganda of India, Limited, is that right?—Yes.

21811. Have either of you gentlemen any observations of a general character which you desire to make before I proceed to ask some questions?—(*Mr. Hutchinson*) I have none. (*Mr. Maurer*) I have none.

21812. Mr. Hutchinson, I propose to proceed with your memorandum for some time. I am greatly obliged to you for the very complete and interesting note you have put before us on the points with which you deal, and I think you have made your views very plain. But there are one or two questions which I should like to ask you. You worked, I take it, as a research officer in the term of your service with Government?—Yes.

21813. Do you think that the prestige of Pusa as a research organisation stands high?—Yes.

21814. Do you think that prestige stands as high to-day as it has done at any time that you have known Pusa?—Yes, I do.

21815. May I ask you one or two questions about your views as to the training of Indians. On page 296 of your memorandum you say, " The present condition of affairs which leads to the resort of Indians to research institutions such as Rothamsted is highly unsatisfactory for many reasons," and you go on to detail the reasons I take it that you divide the matter of training into two parts, the earlier education, and the sort of improvement that results from study-leave and travelling about after the ordinary post-graduate period is over with a view to seeing what is being done in other parts of the world. I want to know from you whether these words of yours, which I have quoted, ought to be taken as including study-leave for travelling about after the ordinary post-graduate training?—I am referring entirely to post-graduate work, and my remarks are based on my personal experience in the Agricultural Service, and especially at Pusa. There we have had instances of Indians in the Agricultural Service going to England in order to get testimonials which would help them in the future in the Agricultural Service. That is to say, I found men going to Rothamsted to be trained in bacteriology and coming back with the impression that they had a better chance of advancement in the service because they had been to England and Rothamsted than they would have had if they had gone to Pusa and been trained there. The instances in my mind are of this sort; I would not particularise. An Indian comes into my section from a Province to have a post-graduate course in Bacteriology; he puts in two years in my laboratory and goes away. Afterwards he goes to England, does some work there, gets testimonials, comes back to India, and expects to be appointed to a post over the heads of the people in my laboratory from whom he learnt most of what he knows, merely because he has been to England. I maintain not only that this is bad from many points of view, but that at Pusa we shall teach that man, if he stays here for those two years, more about the soil conditions and soil fertility in India than he can learn in other places outside.

21816. Would you go so far as to say that you do not attach any value to the granting of study-leave?—I would not say that; that is a different proposition.

21817. I want to know how you would classify these two matters, study-leave, and that which you are referring to?—So long as study-leave is not taken for getting testimonials which would tend to give the man a higher position, I would

not object. As long as study-leave is not taken for that purpose there should be no complaint.

21818. But may it not be that those who seek the opportunity afforded by study-leave are concerned more with increasing their knowledge than obtaining a mere testimonial?—There cannot be any objection to that. I am only speaking of this particular point as I find it in my experience; and I think it is very necessary to draw attention to it, because it does arise and is likely to arise in the future. I mention it in connection with the suggestion that the aim of the Government of India should be to make Pusa so efficient that it would take the place of institutions in other countries. I do not see any reason why they should not do so.

21819. And you think it would come to that point of efficiency that journeys abroad for training in research work would be unnecessary?—Yes.

21820. On page 296 you say that the position of Pusa, and to some extent its efficiency as a research institute, has been prejudiced by the want of a Director whose whole time could be given to co-ordination of the work of the various sections and to the creation of a continuous policy in regard to the direction of research. Do you think it is conceivable that any man holding the position of Agricultural Adviser to the Government of India could, under any circumstances, give sufficient attention to the work of direction at Pusa to bring that Institute to a high pitch of efficiency?—No; I do not think it is. I think the post of Agricultural Adviser is so important and his duties so onerous that it is impossible for him to do the other job as well.

21821. Does that mean that you would divorce the holder of the post of Agricultural Adviser to the Government of India altogether from research at Pusa?—From the Directorship of research, yes.

21822. From the immediate direction of research?—Yes.

21823. But you would, I take it, give the Agricultural Adviser to the Government of India some responsibility for the general conduct of and policy in research?—Yes, for co-ordinating research.

21824. You do not conceive the Agricultural Adviser to the Government of India having nothing to do with Pusa?—No.

21825. Your idea is that immediately subordinate to him there should be a scientist, or an administrator, I take it, holding both the qualifications required, who would be capable of co-ordinating the conduct of research work at Pusa?—Yes. May I say that the creation of a continuous policy for the work at Pusa seems to me to be a very important point? In the seventeen years I was there, I was under nine separate heads of the Department of Agriculture.

21826. Your hope would be that the man immediately charged with the duty of directing research would stay there for a longer period than do many of the officers?—Yes.

21827. On the same page you point out that teaching is apt to interfere with research work. Would you go so far as to say that the influence of teaching and of a teaching school upon research work is, on the whole, disturbing and ought to be avoided?—Not on research work, but on the research worker if he has got to do teaching as well.

21828. You would not mind his giving two or three lectures in a week?—No, he would be just infusing the spirit of research into the students.

21829. That is valuable to him as well as to the students?—Yes, so long as he does not adopt the *ex-cathedra* attitude of mind which is so prejudicial to research, and which is very characteristic of the teacher.

21830. It is a question of having sufficient staff for the work, reasonably divided between research and teaching?—There should be a duplicate staff.

21831. Otherwise, your research staff is going to be overloaded with educational responsibilities?—Yes, just as in the case of Universities.

21832. About the inaccessibility of Pusa in relation to its future as a teaching centre, do you think that with right teaching and right teachers at Pusa there is anything to prevent students who really mean business going to the place where it is at present situated?—No, not students; I was not thinking of the students. I was thinking of the people who are interested in what is being done at Pusa, and who want to go there, especially Government servants; it is rather out of the way.

21833. Upon the teaching side, you do not think its position is inimical to development as a teaching centre?—No.

21834. On page 297 you give three reasons why, in your view, the use of fertilisers in India has not received adequate recognition, and I want to ask you whether No. 3, which you enlarge upon on page 298, really amounts to this, that there is an absence of sufficient knowledge as to practice and sufficient information as to the scientific aspect of this question at present, upon which to proceed?—Yes, that is my opinion.

21835. You think that more research and closer knowledge in regard to what is going on at the moment in the cultivators' fields must precede any propaganda on a large scale directed towards encouraging the use of fertilisers?—Yes.

21836. Would you like to develop at all the statement that you make that the failure of many of the experiments that have been carried on on this problem of the use of fertilisers in India has been due, as you say, to faulty design of the experiments? I am concerned rather to discover from you whether there is some idea in your mind that the organisation of research is faulty in that respect; mistakes always occur?—Yes, I think you cannot get away from the fact that information on this subject is generally lacking. I find that experiments have been carried out, and yet the information is not there. That must be due to one of these causes. I had done a lot of experimental work myself in connection with various jobs, and a great many of my field experiments had been of no value owing to faulty design, that is to say, my ignorance of the best way of carrying out field experiments in India; and to get that experience takes a very long time and rather specialised training. I think one may say that a great deal of more or less haphazard experimental field work must have been done, judging by experimental results that have been obtained on the use of manure.

21837. Do you think there has been any failure to apply the experience obtained under different conditions in other countries?—I think the failure to apply information obtained in other countries must be largely due to the progressive realisation of the difficulty of applying agricultural knowledge obtained anywhere else than in India, and one might almost say in a particular district in India, to Indian conditions. I think experience in other countries has an extremely limited value in this particular matter.

21838. In many matters you have to start afresh in this country?—Yes.

21839. Do you think there is want of co-ordination and inter-communication between Pusa and the Provinces and between Province and Province?—Yes, I am afraid there is that want.

21840. You attach importance to that?—Yes.

21841. You think there has been lack of what I may term higher direction in this problem?—Yes, I think there has been lack of the realisation of its importance, to start with, and I think one of the reasons I gave is a fair one, that the Agricultural Departments are so understaffed that they have been obliged to turn their attention to what appears on the face of it more important subjects, that is, improvements in crops and improvements in methods of cultivation. That has excluded the possibility of giving so much attention to the use of fertilisers; these two were thought of more importance, and the use of fertilisers was considered as being out of the sphere of practical politics.

21842. Are these problems that you are talking of, the use of fertilisers and the fundamental soil problems, problems which in your view can well be dealt with by a Central Research Institute, or ought they to be dealt with locally, area by area?—They can undoubtedly be dealt with by a Central Research Institute, but there is no reason why they should not also be dealt with in the Provinces. That, I think, should be the future aim, to create a staff which can carry them further. There are certain problems of enormous importance; take the fixation of nitrogen for instance; that has been dealt with practically up-to-date at only one centre, whereas the chances of its solution would have been greatly increased if there had been more men working on it, necessarily at different places and possibly under different conditions over a larger area in India.

21843. *Professor Gangulee*: You suggest the repetition of the experiments done at Pusa?—Yes.

21844. *The Chairman*: With a view to ascertaining all the information about their local application?—Yes.

21845. May I take it, Mr. Maurer, if you do not say anything, that you agree, broadly speaking, with what Mr. Hutchinson says?—Yes.

21846. On page 298, you say that in adopting the procedure of going in for a moderate degree of fertility, the ryot appears to have been unconsciously recognising the existence of natural recuperative forces and adapting his agricultural methods to their rate of operation. To look at the thing from another point of view, does that mean that with improved varieties or better feeders the problem of providing sufficient food for these new varieties arises, and that before you can economically over a series of years adopt new and better varieties of crop, you must face the problem of nutrition?—Yes; that is the view that I have held for some years now. I may say that when I first put forward that view in Bombay, it was a very unpopular one; I was very heavily jumped on for having suggested that the general policy of the department had been wrong in producing these high-yielding varieties of crops and of improved implements, and not making any provision for putting back into the soil the extra amounts of plant food removed from it. I do not think there is any getting away from that point of view that, if you are going to take more out of the soil than is put back by natural processes, you must sooner or later arrive at a point when you will get reductions of yield.

21847. You may escape punishment for a year or two, but sooner or later nemesis is on you?—Yes. We have had an interesting case of that in the improved Pusa wheats. Those wheats are used with great success in many places in India, but they cannot be grown by the ryot round Pusa, except on one or two very strong soils. He finds if he grows those wheats on his ordinary wheat soil he gets a smaller crop, not in ten years but the next year. That is a very best wheat indication of what may happen, and will happen in time, on the very best wheat soils, and I think there is no getting away from the fact that you have to take cognisance of the possibility of its becoming a general phenomenon in India.

21848. Do you regard artificial fertilisers as an alternative to cattle manure or as supplementary to it?—Certainly supplementary; nothing can take the place of organic matter in the soil; you can increase the amount of organic matter by stimulating the growth of crops by mineral manure, but you cannot replace it altogether.

21849. In your knowledge, have sufficient experiments on the economic side of the use of fertilisers in India been carried out?—I am aware of the fact that they have been carried out, but I am not sufficiently informed as to the details to give any information on it. I know that they have been carried out and that they are being carried out; of course, you have the outstanding case of the tea industry where they could not do without them.

21850. The economic problem is complicated and aggravated to some extent by the fact that over large tracts the whole season's crops may fail as a result of the failure of the monsoon, which means of course that if expensive artificial fertilisers have been bought and applied and no return accrues, a more serious net loss has to be faced?—It will depend on the character of the fertiliser whether it remains in the soil or not.

21851. Might not that be a very important consideration in certain areas?—Yes.

21852. Would you suggest the creation of some committee or council which would bring the organisations commercially interested in the sale and distribution of fertilisers into touch with Government? Have you ever suggested, or has anybody in your knowledge suggested any scheme of that sort to Government?—Yes; there was a suggestion of that sort. I think it was two years ago, and it was actually put up to the Government of India, I think, by the Agricultural Adviser as a concrete suggestion, that a committee should be formed, especially to deal with the subject of manures. What the composition of the committee was I do not know: I know that it was suggested.

21853. Do you know that agricultural authorities very often lament the fact that the distribution of seeds cannot be handed over to concerns working on a commercial basis? Have you heard that?—I do not think I have heard of it.

21854. You make a strong plea for further research into the agricultural aspects of irrigation?—Yes.

21855. Is that a line upon which you have done much work yourself?—Only in so far as it affects my particular subject of bacteriology. They are so closely allied to each other. The influence of the amount of water in the soil on the

fertilising activity of bacteria is so marked that you cannot get away from it. It seems to me so vital that people who are using irrigation water should know exactly what is happening when they are using it and what is likely to happen if they use too little or too much and the advantages in different small doses and big doses. Our ignorance on that subject in the field seems to be profound. That is to say, the local application of one's laboratory knowledge is a thing that has got to be worked out in all the irrigation tracts in India.

21856. Is that a field in which, in your view, there are fundamental problems which might well be dealt with by a Central Research Institute?—I think so. It is not only connected with irrigation areas but also with other wet areas and even with dry areas.

21857. The process by which nature restores the nitrogenous matter taken out by crops such as rice is rather a mystery, is it not?—We have got some glimmering of the general method. We know that it is a different class of soil. But it is fairly clear that such an action must go on in paddy soil.

21858. Would you go so far as to say that that is a problem of great importance upon which very little work has been done so far?—I should like to go further than that if possible and say that what little work has been done has been of such importance as to show the prime necessity for carrying it on further. There was some work done by Dr. Harrison in Madras many years ago. It has remarkably demonstrated the value of pure research work on the field problem.

21859. Have you ever pondered over the problems of propaganda in agricultural matters?—The only connection I have had so far, just before I left Pusa, was that the Government of India made the making of cinema films one of the functions of the Bacteriologist. That is the only connection I have had with propaganda work.

21860. For how many years have you been engaged in soil chemistry?—For about 28 years.

21861. How much experience of making films have you had?—I had never made them before.

21862. And yet the Government of India put you on to making those films?—Yes.

21863. Did you make a success of it?—They have been exhibited before the Viceroy but I have not heard his opinion. That was a very small affair.

21864. *The Raja of Parlakimedi*: Are you satisfied with the position of Pusa as regards its accessibility by the ryot?—All the ryots round Bihar come and look at our experimental crops at Pusa. They walk through our laboratories and take interest in our work.

21865. Have they been told what the effects of your experiments have been?—I think when one is in the immediate neighbourhood one gets to know what is going on there by asking the staff. They nearly always know what is going on. A gentleman whom I had the privilege of knowing took a very keen interest in the research work. He wanted to know what the effect of our research will be on their own particular style of irrigation. The best way is to ask the cultivator what he believes and what his superstitions are. He has all sorts of queer superstitions. If you find these out and ask enough questions about them you very often find that you are getting information that you did not possess before.

21866. Do you know of any cases in which they have actually adopted the methods shown to them in Pusa research work?—You mean any cases of alterations.

21867. For instance, the use of fertilisers?—They do use fertilisers.

21868. What about the production of crops by means of artificial cross-breeding?—You mean the use of improved variety of crops. They do not employ it except on certain lands where the soil is very strong. There they do not very much care for the varieties of Pusa wheats. But they use some other crops. For instance, there is a large tobacco area in North Bihar where improved varieties of cigarette tobacco have been introduced from Pusa now. Then there is the outstanding case of cane which is being taken up now for the whole of that district. These are Coimbatore canes which are being distributed from Pusa.

21869. Do these private people come to you for assistance on any point?—You mean locally or by correspondence?

21870. In both ways?—Personally we are limited almost entirely to research work on fertility. I should naturally be the recipient of inquiries as to the use of new varieties of crops and improved implements and that sort of thing. If the matter touches my subject, then the correspondence is referred to me. I have correspondence with people all over India.

21871. Do you encourage this sort of practice?—Yes. It is naturally of extreme interest to anybody who is doing research work to be in touch with the people who are possibly going to make use of it. I have had experience before I went to Pusa because I was with the tea industry in Assam, so that I had a very thorough drilling there by being in touch with the people who are actually working on the soil.

21872. Was any portion of your work translated into the vernaculars and published by the Government in the shape of bulletins?—I am afraid there will be certain technical difficulties in connection with technical terms and so on. There was however one exception to that. I had the privilege of introducing a method of dealing with green manures twelve years ago in India and that method was adopted all over India and I understand that some vernacular translations of it were also published.

21873. When you do discover anything really useful, do you have it published in English bulletins?—As soon as one gets any results, they are published in the form of either memoirs or bulletins, or in the *Agricultural Journal of India*. That is circulated all over India.

21874. *Sir James MacKenna*: With reference to your operations in the film manufacturing line, was not that duty imposed upon you by virtue of the fact that you are a well known photographer and artist as well as an Imperial Bacteriologist?—Yes; that was a coincidence.

21875. One or two questions arising out of the questions which the Chairman has put to you. You were very emphatic about the training of Indians in England?—Yes.

21876. We have heard a good deal of evidence favouring a scheme such as follows; to pass through the course of a local agricultural college, to work for some years in the section on the field in the case of an agricultural assistant, and then to go to Europe to the best man on the subject which he proposes to take up. That, of course, refers to men in the Service who are qualifying themselves for promotion to the higher course. Do you like that method?—It depends on the subject they have proposed to take up.

21877. You will limit it to the subject?—Yes.

21878. Then your original statement would not be general?—I should not like to make it general because I am not in a position to do so. As far as my subject is concerned, I am prepared to maintain that at Pusa he will learn more about soil bacteriology than he could learn anywhere else.

21879. In the case of soil bacteriology, a man's training could be absolutely complete in India. You would not give him the advantage of learning what the leading authorities at Home do for the simple reason that he would possibly not be benefited by it?—I do not know of any one at Home.

21880. So far as soil bacteriology in India is concerned, India can provide all the training necessary?—That is my opinion.

21881. What type of Director would you like to have at Pusa? You have seen many kinds?—I am afraid he would have to be a sort of angel! Do you mean whether he should be more of an administrator or a scientist?

21882. Yes?—The first thing he has to do is to carry weight as a scientific authority not only with the men under him at Pusa, but with the men in the Provinces and the Government of India.

21883. It is rather a direct question, and I do not want you to mention names, but have you had anyone in the Agricultural Department who could meet the requirements?—We have had somebody who could have done so, but I doubt if it is possible now.

21884. It looks as if it would be necessary to comb out England to get the best type of man as Director?—The position now is that everyone connected with Pusa has become a prophet in his own country.

21885. I see that as a solution of the geographical and other difficulties of Pusa you recommend its complete annihilation, if and when the Government of India

can afford to turn it into a brickheap. Do you not think it would be better to have the institute in Southern India, in surroundings similar to those prevailing in a very large area of India : wet conditions as against the semi-dry conditions of Pusa?—I am afraid I do not, not only for administrative reasons but because of one very important thing, the library. It is not often thought of, but a really first class library such as that existing at Pusa could not be duplicated.

21886. What are your views as to the functioning of the Pusa Council?—I have had very little experience of it.

21887. Is it seven men expressing seven different opinions, or seven men expressing views which can be welded into one corporate opinion?—It depends on the Chairman of the Council, *i.e.*, the Director.

21888. That again indicates the need for a man of wide outlook as well as scientific insight?—Yes.

21889. What happened to your work on indigo?—That was axed.

21890. Did the planters make any outcry about that?—Not more than usual; they expressed regret.

21891. That has gone completely?—That has gone altogether. The whole of the special staff was dismissed, and some of it absorbed into the sections.

21892. Have you also had to stop your investigations with regard to sericulture?—I think some of the results have been made use of; in fact, I know they have in Bengal.

21893. So far as you are concerned, I think you had finished that subject?—Yes, I handed it over to the Proto-zoologist.

21894. What happened to him?—He only stayed about a year, I think? 18 months, I think.

21895. Did he finish it?—He presented a report on it.

21896. You have been a member of the Board of Agriculture for many years; what do you think of it? Do you think it could be improved in any way? Should its numbers be increased or diminished, for example?—I think it is a pity it does not have an annual meeting. Its most valuable function is interchange of information and working in the direction of co-operation and co-ordination and the prevention of redundancy in work.

21897. You would go back to the old custom of having an annual meeting?—Certainly.

21898. Would you reduce the representation or increase it?—I should certainly not reduce it.

21899. Do you think the sectional meetings serve a useful purpose?—They might, but in practical working they do not, because of the lack of interest on the part of certain individuals.

21900. It would be better to have these people on a general board than to risk the chance of their crabbing the section?—Not only that, but the difficulty in moving from one subject to another is felt when it comes to a sectional conference.

21901. With regard to artificial fertilisers, is it your idea that Government and the trade should co-operate in the dissemination and distribution of these fertilisers? What should the relations between the two be in the matter?—The first point that arises is the necessity of Government departments giving information to the trade as to what manures are wanted, for what crops they are wanted, and what the ryot can afford to pay for the manures and whether they can be used economically. That is for the Government to do. Then, as far as I can see (I do not know much about it yet), it is a question for the trade to see what they can do in the way of providing these fertilisers at an economic rate.

21902. Do the trade expect any financial assistance from Government in the matter?—(*Mr. Maurer*) Ultimately Government will probably have to come in and help the trade.

21903. In what way?—Financially.

21904. To what extent?—The distribution of fertilisers upcountry necessitates the storing of colossal quantities in the interior. It will be so in five or ten years; it is not so at the moment.

21905. To what extent would you expect Government to step in financially?—That is a matter which will have to be thought out.

21906. Have you any views on it?—Not yet.

21907. You would rather say nothing about that?—I would rather see the thing going on for a few years and then devise a scheme to put before Government; but it is possible the trade will require financial assistance from Government later on.

21908. When it comes to deal with the problem on a big scale?—That is it.

21909. *Professor Gangulee*: You have had a number of students under you as research scholars in Pusa?—(*Mr. Hutchinson*) Yes.

21910. In the department of soil bacteriology?—Yes.

21911. What scientific education did they have before they came to you?—I think they were practically all graduates of one or other of the Indian Universities.

21912. B.Sc. or M.Sc.?—Both.

21913. They had a fairly good scientific equipment to begin with?—Yes, because I made a provision that before they came to the laboratory to learn soil bacteriology they should have a training in chemistry first.

21914. Organic chemistry?—Not necessarily, but a sound training in chemistry.

21915. Do you find that the scientific mind develops among your students?—It is my business to develop it.

21916. Do you therefore attach importance to a research atmosphere, as being an efficient means of developing the scientific mind?—The atmosphere will not develop it if it is not there to start with.

21917. But you must have an atmosphere to develop that mind?—Yes, if they have the mind to develop you require the atmosphere to develop it.

21918. Do you notice any change in the outlook of men who have returned from abroad?—Yes.

21919. So that they bring back not merely testimonials but change in mental attitude as well?—Yes.

21920. Can you say the necessary atmosphere to give our students a scientific bent of mind exists at Pusa at present?—Yes, definitely. Students belong to an association at Pusa which has lectures on scientific subjects from its members and from the staff once a fortnight.

21921. You are of the definite opinion that we have at Pusa that research atmosphere which is necessary for development?—Yes, it is very strongly marked there.

21922. Could you mention one or two research problems the Provincial Governments are not now in so good a position to deal with as they were formely? Can you mention any, for instance, which the Government of Bengal have had to discontinue or are unable to undertake?—I have nothing to do with the Government of Bengal.

21923. You have recently left Pusa, where you were, I take it, in touch with the research work being done by the Government of Bengal?—I have done some myself.

21924. Do you know of any research work in the Provinces which has had to be discontinued?—Yes, I think I do.

21925. Will you mention some?—I would rather not mention it.

21926. You make the statement here that students sent abroad come back with testimonials and try to supersede the men already working at Pusa; but because these boys have been to other countries does it not follow they have acquired a decided change in their outlook and therefore are, in a way, better equipped than the men already in Pusa?—It depends what the change is.

21927. You agreed with me there was a change in their outlook?—I *did* not say it was a change for the better.

21928. You say the standard of research at Pusa should be maintained at its present high level. Would you say the standard and quality of research are gradually being improved at Pusa?—The sources of knowledge are being improved.

21929. Do you think at the present time there are men carrying on the tradition of the Howards, Butler and others who acquired an international reputation?—Certainly, yes.

21930. Do you find there is plenty of team work in the research work at Pusa?—Not as much as I should like, but that is a personal view.

21931. Do you find continuity of research?—No.

21932. Without continuity of research, how can you create a research atmosphere?—I do not think they are connected at all.

21933. Take the question of the fixation of nitrogen, in which you are interested. If that work has been discontinued to-day, how would you maintain the interest of the students who had begun to take an interest in it? They are still there though you have gone. I think there has been a decided break in the atmosphere so far as the fixation of nitrogen is concerned; so I maintain that in order to have an atmosphere of research there must be continuity of research?—Such as you would not get by sending a man from India to England!

21934. They carry on the same work; they go from one atmosphere to another and perhaps a better one?—No, I think it is a different atmosphere, and that there is a very big break.

21935. You agree there is no continuity of research work at Pusa?—Not as much as I should like to see.

21936. Who is carrying on with the nitrogen fixation question now?—My successor, who was my assistant for twelve years and took over from me.

21937. You say the mind of the teacher is fundamentally opposed to the mind of the humble seeker after truth. Will you amplify that?—Perhaps that is a matter of experience.

21938. Both are humble students after truth, are they not?—The reaction of teaching upon the mind of the person who teaches is to produce the dogmatic attitude of mind which is incompatible with the attitude necessary for research.

21939. Turning to the memorandum that was submitted to us sometime back by Messrs. Shaw Wallace and Company, and the précis that you have submitted to us, do you think adequate attention has been given to the nitrogen problem?—Do you mean the use of nitrogen as manure?

21940. The use of nitrogen as manure and the investigation of problems relating to nitrogen?—I do not think so.

21941. The use of artificial manures in India is still confined to tea plantations and rubber plantations?—(*Mr. Maurer*). Eighty or ninety per cent. is taken by the plantations.

21942. That work is not the work of the Department of Agriculture, but the work of commercial enterprise?—As regards tea, it is the work of their own Scientific Department; there is no commercial propaganda except ordinary advertisement.

21943. What part have the Provincial Departments of Agriculture played in the introduction of artificial manures in the plantations?—Very little with regard to tea and coffee.

21944. The Tea Association has its own organisation; as to others the commercial firms undertake the work of propaganda?—Beyond ordinary advertisement and the issue of pamphlets, we have not done any propaganda.

21945. In memorandum* "B" of Messrs. Shaw Wallace and Company, you state, "Agricultural Departments have, at no time in the past, shown any inclination or ability to assist commercial enterprise directly in establishing a demand for artificial manures." Is that your experience?—That has been our experience; we have tried for ten years.

21946. Did you seek the assistance of the Department of Agriculture?—Yes.

21947. With what result?—We have never been able to get hold of the ryot through the Agricultural Department in the past.

21948. What is the attitude of the department as an official body?—They do not give sufficient information on the subject of manure to the ordinary cultivator.

21949. Do they join in the propaganda carried on by your company?—Not in the past.

*Not reprinted: Central Government Memorandum dealing with Fertilisers prepared for the Commission.

21950. The British Sulphate of Ammonia Federation, Limited, have sanctioned £20,000 for propaganda. When you had a similar propaganda campaign, did you seek the assistance of the Department of Agriculture?—Yes.

21951. With what result?—They promised their support.

21952. Did they do anything in action?—We have been going only for the past six months, and it is very difficult to express an opinion on that.

21953. The Indo-Agri, Limited, I take it, is chiefly organised for the purpose of retail selling?—That is right.

21954. Not wholesale?—For selling to the small men in small quantities.

21955. You have a flat rate of profit of Rs. 7-8-0 per ton?—Yes.

21956. What is the organisation which you have created for distribution?—The organisation is a distribution combination which will have a large number of depôts in the interior of India, and in these depôts the fertilisers recommended by the Agricultural Department in particular districts will be sold, and will invariably be sold on a basis of profit, which is not intended to exceed Rs. 7-8-0 per ton for the time being, but we will have to feel our way. This profit may be cut down later on if the profit is increased; we may have to put it up if the losses for the next two or three months were considerable.

21957. You consider that a policy of a flat rate is good?—We are elastic. If we find the flat rate does not work we shall revert to district rates or provincial rates. We are merely feeling our way; we have adopted the system of a flat rate tentatively; if we find it does not work, we can alter that.

21958. Do you propose to ask the Agricultural Department here to assist you?—We are doing so wherever possible. In fact the Indo-Agri will have depôts in the interior; in a large number of instances we shall be working with co-operative banks and societies wherever they are capable of taking up the business from the financial point of view and the working point of view.

21959. That will help you to eliminate the intermediaries?—It will, although we find our own upcountry agents are really as cheap as, if not cheaper than, the co-operative societies in their charges. That is our experience.

21960. When did the idea of Indo-Agri occur to you? Is it recent?—It is a recent idea, only a year old.

21961. It is not in working order yet?—We are working; we have a hundred depôts in the interior all over India.

21962. Do you think anything can be done by way of cheaper railway freight to popularise manures?—We had intended moving with regard to railway freights, but the Royal Commission was appointed and as we expected they would take up the problem, we thought it would be unwise to take it up ourselves.

21963. Have you any definite suggestions to make?—I have not looked into the problem.

21964. Are you satisfied with railway facilities?—It is rather difficult to say. Of course the railway facility from the point of view of fertilisers is too small.

21965. How do you distribute the fertiliser depôts?—We distribute them along the railways. We have also a few depôts in thickly populated agricultural tracts which are not on the railway lines; and we carry the manure there in carts or motor lorries. As far as possible we confine ourselves to the railway lines.

21966. What about phosphatic manure?—Wherever they are required, we store them at the depôts. At the moment we are selling superphosphates in the Madras Presidency wherever the Agricultural Department prescribe it along with nitrogenous fertilisers.

21967. Do you manufacture superphosphate in India?—Superphosphate is imported. It is not a paying proposition for manufacture in India.

21968. Because of sulphuric acid not being available?—Because there is no suitable rock-phosphate.

21969. Could you not utilise bones?—That is not an economic superphosphate. Bones are exported for the manufacture of gelatine and they command a price which they can never get if used as a fertiliser. Imported superphosphate is cheaper as a fertiliser.

21970. Would you ascribe the high price of bones to the fact that they are exported from this country?—The price of bones is high because they are exported for a purpose which has nothing to do with their manufacture as a fertiliser; they are exported for the extraction of gelatine.

21971. You are not in favour of prohibition of export of bones from this country?—I am not in favour of that, although I am not personally interested in the export of bones. I can see no benefit which can be derived from stopping exports.

21972. While the sulphate of ammonia will replenish our soil with a lot of nitrogen we shall have to starve for phosphates?—Not necessarily; you can import phosphates.

21973. We will have to depend on imported phosphates if we export our bones?—You are merely replacing the bones you export and at a cheaper price than the price you get for your exports.

21974. *Mr. Kamat*: On page 296 of your memorandum you say, "The adoption of the recommendations of the Lee Commission which stopped recruitment to the Agricultural Service in England, taken together with the fact that the comparatively low rate of remuneration has failed to attract a sufficient number of the best class of Indians....." I should like to know whether this diagnosis is quite correct. Have you really noticed that the number of Indians attracted is distinctly smaller and that the quality is not the best?—(*Mr. Hutchinson*). The cadre of the Imperial Agricultural Service is 150, and there are 49 vacancies, because there are not qualified Indians to fill them. You may infer from that that there are not sufficient Indians taking interest in scientific agriculture.

21975. The Lee Commission's recommendations came into operation only a couple of years ago?—Yes.

21976. Is there sufficient time to make an inference?—It gives a sufficient indication to be referred to as one of the reasons.

21977. Have you had sufficient indication before the Lee Commission's recommendations came into operation that the recruitment in England helped you in this respect?—There was distinct indication of the difficulty of getting Indians of sufficiently good education for the posts we wanted them to fill.

21978. Is it not possible that probably, as you suggest in the absence of a Director of great scientific reputation, Indians might not have been attracted to Pusa?—They were attracted, but they were not of the class we wanted.

21979. You mean they are attracted, but they are not of the best class?—Yes: I do think so.

21980. Do you not look to the other factor for your diagnosis, that you have not a whole-time Director and a man of distinctly high reputation as you yourself admitted in one of your answers?—I think we do want a man of that type, and it is one of the factors that would affect it.

21981. Would you get the best class of Indians if you increase the pay?—I think the best class of Indian must react to the economic basis. If they are going to get higher pay by going into law, they are not going to take up agricultural research.

21982. *Sir Henry Lawrence*: You have laid some emphasis on bacteriological study in relation to irrigation, and you suggest, I understand, that irrigation problems should be examined in relation to the soils. Is it not necessary to have the irrigational problems examined near the canals?—The advantages of having a separate Institute for this purpose would be that that Institute would be in a typical irrigation area and would be working on the soils which have been under irrigation for some time, and it would be possible to compare the condition of those soils from all points of view, physical, chemical and biological. I think there would be undoubted advantages in applying the fundamental knowledge that is going to be acquired at Pusa to specific problems that would arise in an irrigation area.

21983. Those problems ought to be investigated by subsidiary Institutes working on the canal areas?—What I mean is that they have far too much work at Pusa; there would be so much to be done in regard to the investigation of the condition of the soils and irrigation that it justifies a special staff which would be able to devote more attention than the Central Research Institute could.

21984. You advocate that that special staff should be engaged in every important canal area, for instance, separately in the Punjab, separately in Sind, separately

in Madras, separately in the Bombay Deccan?—If the money could be provided, undoubtedly that would be the best way of doing it.

21985. Are those problems somewhat different according to the climate and soil?—Yes, but not so very different that all of them would not benefit by the institution of one laboratory, if they could not have one of their own.

21986. Can these irrigation problems be examined where there is no canal? Have you a canal at Pusa?—We have got a sort of semi-defunct canal.

21987. Is it sufficient for the purpose of examining these problems?—I would not say so; it is not a normal canal at all.

21988. I am not quite clear as to your definite suggestion. Would you like to have this special officer working in a canal area, or do you want him to work at Pusa?—I am suggesting that a special Irrigation Laboratory should be set up in a typical irrigation area, preferably in the Punjab.

21989. Would that officer be able to throw light on all those problems that arise in irrigational areas, for instance, water-logging?—It would not be one officer; you have got to have a complete staff to deal with fertility problems.

21990. One would be water-logging?—Yes.

21991. Another would be soil efflorescence?—Yes.

21992. And the alleged decrease of the fertility of soil under canal irrigation?—Yes; that is very important.

21993. Have you any views on that point? Recently, a statement has been made by an eminent scientist that the fertility of lands decreased under irrigation, and he based that, as I understand it, on his own experience in the Punjab and in Sind, and he quoted the case of Egypt. Have you any information yourself on that question?—Do you mean as to the possible production of alkali?

21994. Actual decrease in the yield of crops?—I am afraid I have not any personal knowledge of that. I am afraid I really do not know enough about the field side of that question to deal with it at all effectively. But there was a suggestion coming from a scientific authority that irrigation might produce a serious condition of unfertility, and that, I think, has special reference to the Sukkur Barrage. To my mind, that particular reference would justify the setting up of a research laboratory in order to find out whether what that scientist had said was true or not. I am afraid that I could not agree with almost anything that he said on the bacteriological side; it was a series of generalisations based on imperfect knowledge of the facts of the case.

21995. You remember Mr. Howard's presidential address to the Indian Science Congress last January?—Yes; I am afraid his enthusiasm carries him beyond his knowledge in that particular point.

21996. *Dr. Hyder*: Is that quite correct? I wonder if you have heard that so long ago as 1854 or 1855, the people in the district of Agra and other districts along the Ganges Canal complained that their lands had become cold. I wonder whether you have come across any such complaints?—Their feet might become cold.

21997. You think it is one of the general superstitions.

21998. I wonder whether the subject was taken up by the Government of India. Did not Sir Edward Buck take it up?—Did he come to any conclusion?

21999. *Professor Gangulee*: His work was chiefly in connection with the formation of alkali deposits. Mr. Ball carried on some work and it was followed by Sir Edward Buck's efforts?—I think the general conclusion was that we want more information; that is all that we have got about it.

22000. *Sir Henry Lawrence*: That information should be obtained before these big schemes are put in hand?—That is my general impression, and I give it for what it is worth. These dreadful things about new irrigation schemes may be avoided by a proper utilisation of irrigation water. You can ruin the land by over-irrigation, but it does not follow from that that irrigation is a mistake; you do want information as to the best way to use it.

22001. In your note on page 300, you state that Dr. Voelcker's suggestion of importing firewood to remedy the defects of burning cattle manure is unfortunately an impracticable one. Is there any other remedy that you can suggest?—You mean for the lack of firewood?

22002. To avoid the burning of cowdung?—No; I cannot think of anything. It is a deep-rooted habit, and it is so obvious a thing to depend upon for the people. The alternative is to let it go on and use artificial manure instead. In an area like North Bihar, round about Pusa, you have one of our fertile tracts in India. It is so fertile that every square yard is under cultivation. There is no jungle for firewood and no grazing for the cattle, and as a result of the fertility the condition of the people is very bad. They suffer from malnutrition, malaria, and everything of that sort as the direct consequence of the extreme fertility. One of the things they do is that they burn their cowdung, and because they have no other fuel they suffer from malnutrition as they cannot cook their food properly. I do not see any way of avoiding the use of cowdung fuel in an area where that sort of thing is liable to happen.

22003. There is no other alternative?—No.

22004. *Sir Ganga Ram* : On page 297, you give three important lines of operation for the maintenance and enhancement of the productive power of the soil; the first one is improved methods of cultivation and improved tillage implements. Can you briefly explain what you mean by methods of cultivation?—I am afraid it would take rather a long time.

22005. I want to know briefly what you mean; do you mean turning of the soil?—Yes, practically.

22006. Is that all that is in your mind?—It practically comes to that; you may take it as the best way, the best time, and the best depth.

22007. You know that in some places turning of the soil is condemned?—I know it is; in those places you should not do it.

22008. You have given only three important lines of operation; do you not think you should add another important thing, namely, proper knowledge of rotation?—That would come under the head of methods of cultivation.

22009. Under that head everything will come?—Yes.

22010. Do you not think that it should be prominently put down?—I quite agree.

22011. I only wanted to know whether you would not put down as No. 4, proper knowledge of rotation?—Certainly, yes.

22012. You have put down a point about the fixation of nitrogen, with which I agree. Do you not think that fixation of nitrogen from the air can best be done by exposing the soil many times to the air?—Generally speaking, that is so.

22013. That is our knowledge, and I have made experiments in that direction. By turning over the soil twenty times I got double the yield?—I know, but you confuse cause and effect there. You might be doing the same thing with improved tillage implements.

22014. Mr. Howard stayed in Manikpur for one month; at that time there were four waterings for wheat; he had only two waterings, and with the two waterings he produced 50 per cent. more. The effect of the experiment has been rather unfortunate, because our water has been reduced by 25 per cent. First of all, the Irrigation Department fixed the duty of water for wheat at 270, and now we are reduced to 333. Really, the increased yield was due to constant harrowing and a very skilled staff. I was only drawing your attention to constant harrowing and exposing the soil to the atmosphere. You agree that it has a very marked effect?—It has a marked effect on the immediate return.

22015. It cannot be done without fixation of nitrogen?—It can be used for making available the nitrogen you already have.

22016. You accept the statement in the agricultural books that each acre of wheat cut takes away 180 lbs. of nitrogen?—No.

22017. In Lyallpur experiments were made, and they have found it to be 95 lbs.?—You have got very fine wheat in the Punjab.

22018. You accept this as one of the natural methods of attracting nitrogen to the soil?—Yes.

22019. Another method was suggested to me this year by an ordinary peasant, that the soaking of the seed for one week in cattle urine produced bacteria; is there anything in it?—It would be much better to find out for yourself than for me to tell you.

22020. That I will; then I would not want your opinion about the scientific side?—I have not tried it in Pusa, it would not do in Bihar.

I am not familiar with Bihar.

22021. Mr. Maurer, you are a representative of Messrs. Shaw Wallace and Company?—Yes.

22022. We were told in Madras by Messrs. Parry and Company that they were making superphosphates; is that right?—Yes, they are manufacturing small quantities of it.

22023. How is it that other firms are not making it?—Messrs. Parry and Company have got certain rock-phosphates; they manufacture sulphuric acid and therefore they are able to produce superphosphate.

22024. I think it was your firm which wrote to me that the question of railway freight was a difficult question, and recommended my taking it up. I want to know whether, in the fertilisers sent out by your firm, there is a good deal of adulteration with river silt?—Adulteration! Where?

22025. In your firm, or by whoever sends it to the Punjab; we have found it containing a good percentage of river silt?—In what material?

22026. In the fertilisers?—What type of fertiliser?

22027. I cannot tell you the name. You deny that there is any adulteration?—There is no adulteration at all, so far as I am aware.

22028. That is rather a qualifying statement. I can prove to you if you ever go to the Punjab that it contains a good percentage of river silt?—It must have been travelling up by river then.

22029. Are you suffering from excess of railway freight?—No, we are not.

22030. I have had letters from two or three firms to that effect?—I do not remember having sent any. Anyway, freight does not affect us.

22031. Your interest lies in fertilisers and the zamindar's interest lies in having it of local manufacture. How far can you reconcile the two opposing factors. Can you manufacture fertilisers from some raw material in India?—Fertilisers are being manufactured in India.

22032. Do you use all Indian raw materials in them?—Sulphate of ammonia is manufactured here.

22033. Some fertilisers are very dear and unless you are going to make them cheap, there is no prospect of the propaganda work appealing to the people?—We are aware of that fact.

22034. So, there are two things against it. First adulteration and, second, the fact that you are trying to import everything ready-made?—What we are selling to-day in the way of sulphate of ammonia is all made in India.

22035. But nitrate of soda is all imported?—Yes.

That is a very important fertiliser for wheat in our part of the country.

22036. *Sir Thomas Middleton*: You have pointed out that there are a large number of vacancies which have not been filled in the Superior Agricultural Service and also that facilities for post-graduate instruction can well be provided in India. Do you not think that as these vacancies have appeared only during the last year or two students have not had time to prepare themselves to fill them?—(*Mr. Hutchinson*). It is quite possible.

22037. Would you accept the statement that you have now a number of suitable graduates who are turned out by Indian Universities and therefore there should be no lack of well qualified candidates for post-graduate study, who would afterwards qualify for posts in the Superior Service?—I think so.

22038. It is difficult to reconcile the economic position of the students with the fact that so few applicants seem to be coming forward for these higher posts?—I do not say that they are not coming forward but that they have not got the qualifications for the appointments.

22039. If a sufficient number is coming forward, then one would suppose that you would find among them some persons suitably qualified?—I am afraid that is not the case because you require rather special qualifications.

22040. They do require special qualifications but for these special qualifications they could have or might have had post-graduate instruction at Pusa, for instance?—Yes.

22041. Do you not think that when the position is realised there will be a great many more candidates for post-graduate training at Pusa? Will not vacancies tend to draw students?—It would certainly increase the number of students.

22042. What period of post-graduate study would you regard as necessary for a student who has got his Bachelor of Science or Master of Science Degree at a University here?—I should think two years is the minimum.

22043. You know that in Britain we aim generally at three years?—Yes.

22044. What are the essential points that one has got to look to during the student's post-graduate course? What are the reasons which have led you to say that work can be better done at Pusa than it could be done in England, for example?—I am dealing with my own particular subject. Do you know who lectures on soil bacteriology at the Cambridge University?

22045. I could not name him?—It is Professor Biffen.

22046. Your point is this that in India you have got the problem ready-made for the student?—Yes.

22047. You may or you may not have the teacher. Assuming that you have the qualified teacher, you could more easily provide the post-graduate student with a suitable problem in India than you can in Britain?—That is so.

22048. Coming to another question, you have drawn attention in an interesting way to the theory of depletion of soil fertility. The Indian cultivator has a size of crop which he can afford to grow safely but if you pass that limit there is a danger of depletion of fertility. You have given us one instance in the case of the Pusa wheats. Can you give us any other instances from your experience?—Not with the same amount of confidence.

22049. You have come across indications?—Yes.

22050. Is it not quite a likely thing that in newly irrigated areas that phenomenon should show itself?—It depends. For instance, rice irrigation by streams coming through the jungle implies deposition of fertilising silt.

22051. I was thinking of the wheat?—In canal areas, irrigation might result in depleted fertility.

22052. I rather expected that you would be able to give cases from these irrigated areas?—I have not got them. I only wrote this note in the last few days since I arrived in India.

22053. In making this general statement would you exclude leguminous crops from the statement that there is a danger in growing more than a certain amount?—I would exclude them because of their useful addition in the form of leaf mould during their growth.

22054. Your dictum applies chiefly to the cereals?—Yes.

22055. You point out how necessary it is to get reliable information as to the value of fertilisers before you can get ahead with propaganda in any form. What steps do you think are necessary in order to get that reliable information in this country? Do you think that it would be necessary to have a very considerable number of permanent stations representing different areas or would you prefer to follow the method which has been commonly followed in Great Britain of taking up temporary areas on cultivator's land and testing out the problem there?—My limited experience would suggest the latter course as being the better of the two.

22056. Do you think that information would be sufficient and reliable in the case of the Indian crop?—It is as reliable, I think, as you can expect to get it anyhow. The great difficulty in field experiment in India in nearly every case is the difficulty of designing your experiments so as to make due allowance for the extraordinary variation in the soil from one plot to the next.

22057. In that connection have you studied the recent movement in the United States by which the State Expert has got into contact with the manufacturer, has had a standard formula for manures for particular areas prepared and has recommended the use of manures made according to the formula?—I do not know how it is worked out.

22058. It has been done to a considerable extent?—Is that a reliable method in the States?

22059. It is a method which they have adopted after a great deal of experience?—I see.

22060. You realise, of course, that the Expert first gets his facts. He knows how to prepare his formula and the object of the combination is to effectively carry out propaganda?—Yes.

22061. You emphasise the need for some sort of advisory council, which you say should be representative. In what sense do you use the term 'representative'? Do you mean representative of the technical workers or of the administrators?—I think of both.

22062. Have you worked out the size of the council for India?—No. That is probably a difficulty you cannot get away from in dealing with Indian things.

22063. Have you studied the methods by which we attempt to deal with the situation in Britain?—No.

22064. Then I recommend you to do so. You draw attention to the need for further work in soil bacteriology?—Yes.

22065. There are two courses open to you; to increase the number of central institutions such as Pusa, or immediately to proceed to furnish bacteriologists to work in conjunction with the Agricultural Department in the different Provinces. In order of development, which would you select first?—You have the one at Pusa already.

22066. Would you add a second and third institution of a similar kind in other areas in India, or would you prefer to begin Province by Province to make appointments of bacteriologists on the agricultural staff of the Provinces?—I think the second method would be easier to adopt, and you would get results more quickly by it.

22067. Do you think you would have difficulty in finding candidates?—I am afraid you might.

22068. Would it not mean that a scheme would have to be prepared and men put into training for the work?—Possibly, yes.

22069. You point out the value of fertilisers in connection with the production of fodders. I would like some indication of the fodders you have in mind?—I am not sure I should like to particularise. It was merely a general suggestion which I feel is obviously a sound one.

22070. On page 299 you refer to the fact that a considerable amount of information has been obtained on the subject of nitrogen exhaustion. Do you mind giving references?—You will find that in the Pusa reports from year to year.

22071. Would you mind sending in a list of references to the Secretaries on that particular point?—I will try. I may have to refer you to Pusa, because I have not the documents in Calcutta.

22072. *The Chairman*: Help us as far as you can, and we will go to Pusa if necessary?—I shall do so.

22073. *Sir Thomas Middleton*: When we first met I was a teacher and you were beginning your career as a humble seeker after truth. I hope you did not form this estimate of the teacher's mind which I find in your precis while you were at Cambridge?—No, not of the teacher's mind, but of the interference with research work by teaching and administrative duties, with which I think you will agree.

22074. Do you not agree that the danger is in connection with elementary teaching, preparing under-graduates for examination; that is the teaching you had in view?—I do not know it was entirely that.

22075. You do not always find the dogmatic type of mind in the University teacher, do you?—No.

22076. *Dr. Hyder*: I do not know whether you advocate the use of sulphate of ammonia?—No, I am not concerned with the use of any particular form of manure.

22077. You as a scientist say the use of these artificial manures should be encouraged, but the gentleman who represents the commercial side says the tea-planting industry cannot make further use of this particular material, because they are afraid their prices would go down. I cannot reconcile the conflict there, and I do not know how you will solve it between you?—(*Mr. Maurer*). That is not what is meant. The demand for sulphate of ammonia for tea plantations, just like the demand for any other particular fertiliser, is limited. Probably more types of fertilisers are used with tea than with any other crop. Something like ten varieties of fertilisers are used with tea, of which sulphate of ammonia is only one.

22078. I do not see, Mr. Hutchinson, what would be the good of a committee in the absence of definite information with regard to the deficiencies of different types of Indian soils; knowledge we have not yet got. The first thing is to find out what are the deficiencies; and then it may be worth while for scientists, commercial men and propagandists to meet round a table?—(*Mr. Hutchinson*). When I suggested a committee my idea of its functions was that it should draw attention to this want and suggest means of getting that information. The committee is not to control the way in which it should be obtained, but to make suggestions.

22079. With regard to the control exercised by the editorial board of the Director at Pusa, what is its nature? Does it mean that if something does not come up to the required standard it will be put in the wastepaper basket, or does the Council send suggestions to workers in the Provinces pointing out where they are wrong and making suggestions?—The editorial function is merely to set a standard. They are not concerned with the opinions expressed at all, but with the standard of research work exhibited by the experiments conducted and the memoir submitted. If the standard of work sent up is not what the Council considers sufficient it is not published, and suggestions are made for alterations or improvements.

22080. With regard to the statement that nitrate of soda is washed away on account of heavy rainfall, have you any evidence of that?—(*Mr. Maurer*). It is known to be liable to be washed away, that is a scientific fact.

22081. Is not it used in other tropical countries?—To a certain extent.

22082. In Cuba and the West Indies?—Yes.

22083. There is heavy rainfall there?—They use far more sulphate of ammonia in the West Indies.

22084. Not Chilean nitrates?—Very little. It is the same in Java.

22085. *Sir Ganga Ram* : For what crops?—Sugar.

22086. *Mr. Gupta* : You say you have 100 depôts in various parts of India?—Over 100; about 120.

22087. How many have you in Bengal?—Roughly 30.

22088. Have you any near Calcutta in the Presidency Division, these five districts?—No, they are chiefly in Northern Bengal.

22089. *Sir Ganga Ram* : Have you any in the Punjab?—No, not yet.

22090. *Mr. Gupta* : If you have any, there are other organisations besides Government which may help you. The District Boards are very keen on helping the ryots to get artificial manures?—Yes. We are in touch with some of them.

22091. If you would like me to put you in touch with District Boards in this Division, I shall be very glad to do so?—Thank you very much.

22092. *The Chairman* : There is nothing you wish to add?—No.

(The witnesses withdrew.)

The Commission then adjourned till 10-30 a.m. on Tuesday, the 7th December, 1926.

Tuesday, December 7th, 1926

CALCUTTA

PRESENT :

The MARQUESS OF LINLITHGOW, D.L. (*Chairman*)

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S.
Sir THOMAS MIDDLETON, K.B.E., C.B.
Rai Bahadur Sir GANGA RAM, KT., C.I.E., M.V.O.
Sir JAMES MACKENNA, KT., C.I.E., I.C.S.
Mr. H. CALVERT, C.I.E., I.C.S.
Raja Sri KRISHNA CHANDRA GAJAPATI NARAYANA DEO of Parlakimedi.
Professor N. GANGULEE.
Dr. L. K. HYDER.
Mr. B. S. KAMAT.

Mr. J. N. GUPTA, I.C.S.
Rai A. C. BANNERJI Bahadur. } (*Co-opted Members*).

Mr. J. A. MADAN, I.C.S.
Mr. F. W. H. SMITH. } (*Joint Secretaries*).

Khan Bahadur M. A. MOMEN, Magistrate-Collector (on leave) and late Offg. Director of Land Records and Surveys, Bengal

Replies to the questionnaire

QUESTION 1.—RESEARCH.—(*a*) (*i*) No special agency is necessary for carrying on research affecting the welfare of the agriculturist. Settlement operations have been completed in two-thirds of the Province and will soon be completed in the rest. Careful investigations are made by Settlement Officers into the economic conditions of the agriculturists and the results of such investigations are embodied in their final reports. It is a pity that these reports are not more widely read or utilised, but it is hardly necessary or possible to make better investigations.

Improvements in the economic condition of the agriculturists can be most suitably done by the Union Boards under the guidance of the Collectors of the districts who ought to take more interest in them than they generally do at present. The department of Government which can render the greatest good to the agriculturist and in fact is their only saviour is the Co-operative Department, and Government ought to give much greater facilities to it than is done at present.

Scientific research affecting crop yields, crop values, soil selection, suitability of crops, must be centred in the Director of Agriculture. I am in favour of a research institution for each Province as conditions in Bengal differ so greatly from the rest of India. All advanced scientific research should be done at one centre, as is done now at Dacca, but District Agricultural Officers should be encouraged to experiment with different crops and given much more freedom of action than they have at present.

The District Agricultural Officers should be required to make careful enquiries into the requirements of agriculturists in particular localities within the districts, and into the possibilities of improvements of agriculture there either by irrigation, embankments or introduction of new crops, etc. Their reports and recommendations should be submitted to the Collector and the Director of Agriculture and tested by departmental officers. District Officers can then take these in hand and try to effect the suggested improvements either themselves or through local agencies.

QUESTION 2.—AGRICULTURAL EDUCATION.—(*i*) I have no personal experience of any agricultural educational institution in the Province. There is no agricultural college in the Province and there is only one elementary school at Chinsura.

(*ii*) I do not think it is necessary to have too many agricultural institutions in the country. The boys of the agriculturist classes who attend rural schools hardly require any elementary agricultural education which such schools can impart. I do not think real agriculturists will send their boys to agricultural schools only to learn agriculture with a view to improve their farms. Centuries of experience have given the agriculturists a practical knowledge of their vocation

which can hardly be improved upon by elementary education in a school. What they need to learn is not the botanical names of plants or chemical analysis of the soil, but new methods of cultivation by improved implements, cultivation of new and paying crops and animal husbandry and these should be taught by demonstration and not through books.

I consider only one central agricultural college in the Province necessary, preferably at Dacca, attached to the Manipur farm where both elementary and advanced scientific agricultural education can be imparted to the boys who wish to take to agriculture as a profession. This institution will supply officers and field demonstrators for the Agricultural Department and this will be the incentive to attract boys to it. It is futile to expect that in Bengal boys will flock to the agricultural college to learn scientific agriculture only to become practical agriculturists. The main incentive will be Government service but the surplus will enter private service under zamindars and will start farms of their own. Some middle-class people may send their boys with the sole intention of starting home-farms, but the number of such will be very small. Whatever may be the incentive, the indirect result will be that in a short time there will be many scientifically trained agriculturists in the country and this will go a good deal in disseminating improved agricultural knowledge among actual agriculturists. The farms which such men will start will also serve as demonstration farms to the cultivators and will be more useful to the country than Government farms.

Every district of which I have experience requires facilities for learning improved agriculture. I do not, however, mean that this learning is to be imparted in agricultural schools. I consider it necessary to have a demonstration farm not only in every district but in every sub-division, where cultivators and others can obtain a first-hand knowledge of new methods and of new crops and can be taught how to exterminate insect pests and crop diseases.

Much is being made of nowadays about inducing boys of the agricultural classes to join agricultural institutions with the view that they will return to the farm with improved agricultural knowledge. Those who insist on this do not take into account the peasant psychology of Bengal. An agriculturist who sends his boys to school does so not with the intention of improving his farm but with the ambition that his sons by becoming Government officers or lawyers will improve the social position of the family. A boy who belongs to an agriculturist class joins the agricultural school with a Government stipend not because he wants to go back to his field with improved scientific agricultural knowledge but because he finds it difficult to attain higher cultural education and expects to get a job of field demonstrator under Government by passing through an agricultural institution and not with a *bona fide* intention of adopting agriculture as a profession. It is the sons of the middle-class gentlemen who have now turned their attention to this industry finding other avenues of employment overcrowded. It is better to face facts than wallow in theories.

As regards the introduction of agricultural teaching in primary schools, I think all that is necessary is to add a book on agriculture to the ordinary school curriculum dealing with elementary agricultural science such as soil moisture, insect pest, and selection of crops.

(iii) Not necessary. There is no point in giving preference to teachers drawn from agricultural classes. This will lead to more harm than good as it will encourage agriculturists to give up their profession and become teachers.

(iv) There is no suitable institution in the Province.

(v) Already mentioned under *(ii)* above.

(vi) No. Reasons given in *(ii)* above.

(vii) Suggested in *(ii)* above. I also advocate that a small agricultural and horticultural farm be attached to each high school in the country. Teaching of vocational subjects should be compulsory and agriculture should be one of them. It is more important that the middle-class boys should learn here to use the plough and the spade and realise the dignity of manual labour than that a boy of the agriculturist class should be taught how to grow crops.

(viii) I have no knowledge of nature study. I prefer school farms to school plots. My idea of a school farm is that boys who take agriculture as a compulsory vocational subject in high schools should in addition to theoretical study of the subject, have a hand in the practical management of the farm; each boy or batch of boys having a small plot to grow their own crops or vegetables by which means they can earn something while they study.

(ix) Government services and some of them quite unconnected with the agriculture. Several of the graduates who graduated from the Sibpur College in agriculture

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were made Deputy Magistrates. I know of no one who has taken to agriculture as a profession.

(*x*) Agriculture can be made attractive to middle-class boys if it can be demonstrated to them that it will pay its way. Middle-class boys are already being attracted to agriculture but want of suitable land, sufficient working capital and, above all, want of experience stand in their way.

The present policy of Government is not to let out lands in bigger plots than 25 bighas to one family. It is difficult for a middle-class youth to earn enough from such a plot. I would recommend leasing of a plot up to 50 bighas to a prospective farmer of the middle-class with substantial monetary assistance by way of loan without interest for two years to meet the cost of reclamation, cattle and implements and maintenance. Such a farm should be under the direct management of the District Agricultural Officer, who should control its management and finance till the Government loan is recovered. Arrangements for water-supply by the excavation of tanks and prevention of inundation by erection of embankments where necessary will have to be done by Government. Only those youths who have had an agricultural training in Government schools should be given lands on these concessional terms.

(*xi*) Adult education can only be done by demonstration in central farms and field demonstration in villages on lands of agriculturists themselves.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(*a*) I do not think the activities of the Agricultural Department have influenced to any marked extent the activities of the agriculturists in the Province. The only tangible improvement has been the introduction of the *kakia bombai* jute seed and the *indrasail* paddy in some Eastern Bengal districts. Improved varieties of sugarcane have also been introduced in some localities. The measures which led to these improvements are field demonstration by District Agricultural Officers and the distribution of seeds through panchayats.

(*b*) Effectiveness of field demonstration depends largely on the result and also to a great extent on the personal equation of the demonstrator himself. It is essential that the officer should be keen on his work to carry the people with him in his conviction. I have known few District Agricultural Officers who take that amount of personal interest in the work as they should. The essential qualification in the officer should be his capacity for mixing with the cultivators freely and for convincing them that his intention as well as his duty is to work in their best interest. The next thing is for him to use the very best seed so that the improved method could be easily demonstrated.

(*c*) Cultivators will take and adopt expert advice if it is easily available and found helpful. Bengal agriculturists are extremely conservative and unless the usefulness of the advice is well demonstrated they will not accept any innovations. At present agricultural experts are few and not easily accessible and the advice required can hardly be obtained. It is no use advising a cultivator whose jute is being damaged by insects to exterminate the evil by catching the insects and killing them. It is not advice so much as assistance that the cultivators require.

QUESTION 4.—ADMINISTRATION.—(*a*) I do not recommend more centralisation in the Agricultural Department as has been suggested by some witnesses. On the other hand I consider each Province should be more independent and carry on its own research. The reasons for this suggestion is the totally different climatic and soil conditions prevalent in Bengal. I do not think there need be any all-India agricultural service at all. Facilities should, however, be given for the provincial officers to confer with each other and have a joint agricultural conference in different Provinces to compare and discuss experiments carried on by different officers. Advanced students should also have facilities of acquiring experience in other Provinces so that they may be able to introduce from there new crops and adopt new methods of cultivation.

(*b*) I do not consider a central all-India scientific organisation necessary. Each Province should have its own scientific experts, and they may compare notes by mutual correspondence and conferences. This scientific organisation need not be over-staffed. More money should be available for rural agricultural improvements than for scientific research. My views on the point will perhaps be considered conservative but that is the popular view in this Province.

(*c*) (*i*) Both the Agricultural and Veterinary Departments are undermanned and not properly financed. The Veterinary Department is certainly doing useful work but the want of proper hospitals and the insufficient number of veterinary surgeons and inadequate equipments stand in the way of doing still more useful work.

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The Agricultural Service is perhaps top-heavy. We want more District Agricultural Officers and demonstrators than Deputy Directors and experts, but above all more money for agricultural farms and demonstrations. The Agricultural Department is not very popular with the people and there are many conservative people who honestly think that the money spent by Government on it is wasted. The reason is this that, like other departments, the Agricultural Department cannot show the result of their activities in one or two years. The agricultural farms have not been able to show much tangible result to the country and are generally considered to be working at a loss. The people do not feel that they get their money's worth from this department. The Agricultural Service on the whole cannot be blamed for this, as it is not in its power to show tangible results at short notices without adequate finance and proper equipments. They cannot be expected to prevent failure of crops nor to provide means for the agriculturists to raise bumper crops. There is, however, noticeable in most agricultural officers a want of enthusiasm and keenness due probably to the indefinite nature of their duties. The District Agricultural Officers appear to have a sort of roving commission without fixed definite duties to do and the people think they do not do any useful work at all. The Deputy Directors seldom meet the agriculturists and come and go unnoticed. I have known officers coming to districts for inspection work but not travelling beyond the railway station. Most District Agricultural Officers have no practical work to show beyond meeting a panchayat and discussing improved methods of cultivation with them. The agricultural farms I have seen are all run at a loss and have hardly anything in them to impress a cultivator due to wrong selection of the soil. The department advocated the use of improved agricultural implements but I have seen them use country ploughs in preference to the improved ones. If agricultural farms are to be useful, they ought to be really model ones. The Agriculture Department must show more tangible work if it wants to be popular. *Kakia bombai* and *indrasail* paddy will not carry them any further with the people.

If the Agriculture Department is to be really useful to the people and appreciated by them, its work will have to be modelled on more practical lines. There should be more demonstration and supplies of wants than propaganda as at present. There ought to be an agricultural farm in each district or still better in each subdivision in charge of a District Agricultural Officer where not only improved methods of agriculture should be adopted but new crops suitable to the locality should be grown. There should be different sorts of implements for irrigation and the farm should be able to recommend a particular type most suitable to the locality. The agricultural farm should not only be the centre of agricultural activities for the area but should also be a sort of agricultural emporium which can supply the country around with implements, seeds, manures and necessary advice. People are advised to grow fodder crops, but they do not know when to get the seeds and which is the most suitable for a particular area. The agricultural farm ought to be able to supply not only information but the materials also. A man has got a piece of high land not suitable for jute or paddy, the agricultural officer ought to be able not only to tell him what to do with it and what crops to grow on it but also to supply him the seeds. A particular tract of land otherwise lying unprofitable would grow splendid crops if properly irrigated. The District Agricultural Officer ought to be able to advise how to irrigate it and not only this but to arrange either by forming an Irrigation Co-operative Society or through Government help to set up the necessary irrigation plant and machinery. In brief, the farm ought to supply all the agricultural needs of the country around and unless it does so its existence is hardly justified.

As improved cattle are essential for improved agriculture the farm ought to have stud bulls to improve the local breed. This is very important.

(*iv*) At present the agriculturists do not get any assistance from the Meteorological Department and it is not very likely that they will ever do so.

QUESTION 5.—FINANCE.—(*a*) The co-operative credit societies are by far the best media for financing cultivators in their temporary difficulties for tiding over seasonable wants. But the resources of such societies are limited and cannot meet the demands of large projects. I would recommend the establishment of a District Land Improvement Fund from an annual contribution of about one anna per *bigha* from tenants and landlords, supplemented by a contribution by the District Board. The cost of large organisation, drainage and other beneficial measures should be met from this fund which should also finance rural agricultural co-operative societies at very low rates of interest.

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(*b*) The Government *taccavi* loans are very inelastic and are not popular. I do not recommend popularisation of this system of loan and, if the Land Improvement Fund suggested above be established, there will be no necessity for the *taccavi* loans. In unreclaimed areas, however, it may be necessary for Government to render substantial pecuniary assistance to new ventures as I have suggested in my answer to 2 (*x*) above. In such case, and when no other fund exists and a man wants money for re-excavation of tanks for agricultural purposes or some similar project *taccavi* loans should be given on liberal terms on the security of immovable property. At present the amount allowed is not sufficient to cover cost of projects and the borrower has also to seek assistance elsewhere.

In time of distress agricultural loans are given out to agriculturists on joint security and this prevents such assistance from reaching the really needy person who finds it difficult to get others to join with him. The joint liability system should be abolished or greatly relaxed.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(1) The main causes of borrowing are—(1) want and (2) improvidence.

(*a*) The resisting power of the Bengal cultivators is very small. The average annual income of an agriculturist in Bengal is about Rs. 200 per year for a family of four. If we take 30 per cent of the agriculturist population to be well off and in affluent circumstances, the income of the 70 per cent will be considerably less than the average given. The cost of food and clothing of a convict in jail is about Rs. 58 per year, so that the majority of the cultivators in Bengal have to maintain themselves and their family on much less than what Government spends on the food and clothing alone of a prisoner. It will therefore be evident that a ryot's reserve fund is practically nil when there is a failure of crop which on an average happens once in three years or when his cattle die or there is sickness in the family which prevents the working member from working, he has to borrow to live and cultivate his fields.

(*b*) The Bengal peasant is often blamed for improvidence. This charge however is not correct with regard to the large majority of the 70 per cent. of the peasantry who cannot afford to have even the bare necessities of life. Perhaps it is true to some extent with regard to the well-to-do cultivators in Eastern and Northern Bengal. Such tenants get a good deal of cash when the price of jute is high and the paddy crop is good and get into the habit of spending money on luxuries. Successive good seasons make them optimistic and careless and they borrow on the expectation of a good crop. If this fails, they get into debt and as this is generally at high rates of interest and as their improvident habits make them reckless and uneconomical they generally get badly involved and finally go under.

(*ii*) The chief and perhaps the only source of the peasants' credit is their land and crops.

(*iii*) (*a*) As I have mentioned under (*i*) (*a*) above the resisting power of the cultivator is so small that once the ryot gets into debt it is very difficult for him to get out of it unless there is a windfall. The crops he gets are hardly sufficient to nourish him and his family and to meet the landlord's demand. There is no surplus to pay interest and repay the principal. The ryot's land not being transferable by law, his credit is very small and consequently on account of the risk involved the rate of interest is very high, which is the main cause of his inability to repay his debt which increases very rapidly.

(*b*) The only measure which can lighten the burden of debts of the Bengal peasantry is the establishment of a regular net-work of rural co-operative credit societies with the firm determination of redeeming the lands of the ryots and looking after them in future. Once the rural societies take the indebted ryots under their wings no private moneylender will lend them money and this will keep the ryots away from improvidence. In case of real need they will get help from the societies. If such societies are financed by the Land Improvement Fund mentioned before at nominal interest, they can lend money to their members at much lower rates of interest than at present and can relieve the tenantry very greatly from their difficulties.

I do not think artificial measures like the Usurious Loans Act will be of much avail as the ryot in need and the *mahajan* in many ways defeat the law by circumvention.

(*c*) I am strongly against restricting or limiting powers of ryots to transfer their lands by sale or mortgage. Theorists think that such powers will lead ryots to more improvidence and their land will pass into the hands of the *mahajans* and convert the ryots into landless labourers. In practice, however, lands are freely transferred but as the law gives the power of veto to landlords the risk involved in such transfer greatly reduces the value of the land and consequently

the credit of the cultivators with the result that when the sale of one *bigha* of land would have cleared a ryot's debts, he has to sell three or four *bighas*. It is essential therefore that his credit should be increased by improving the tangible value of his land.

As regards mortgage, I think his power should be restricted to a certain period, say nine years. The ryot is very reluctant to part with his land for good and if mortgages are allowed for indefinite periods he would reduce his income and with it his resisting power by mortgaging a larger quantity of land then selling half the quantity and thus get more and more involved. Non-terminable mortgages and for indefinite periods should be prohibited.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—I have already submitted a note* on this subject and on consolidation of holdings.

QUESTION 8.—IRRIGATION.—Irrigation and drainage are the two most important problems in connection with the agricultural needs of the Province. In fact the prosperity of the agricultural classes depends mainly on their correct solution. The staple food crop of Bengal is paddy which covers perhaps 80 per cent. of the cultivated area. There is very little to teach the agriculturists about the cultivation of paddy which they know from centuries of experience. The paddy crop fails either on account of drought or inundation and if measures are introduced to guard against these two risks, paddy crop will never fail and the peasantry will never starve. For spring crops also irrigation is of the greatest importance. There are many acres of lands in Northern and Western Bengal which could yield valuable spring crops if proper arrangements for irrigation could be made.

There are very few irrigation canals in Bengal, Midnapore and Burdwan being the only two districts partially served by them. The old system of irrigation in Western Bengal was from tanks. Formerly when landlords used to live in the villages and took interest in the welfare of the tenantry they considered it an act of merit to excavate large tanks both for the supply of drinking water for men and cattle and for purposes of irrigation. Their income from rents not being dependent on the crops and they having migrated for greater luxury to towns, the zamindars have lost all interest in the tenants or their needs. The old tanks have gradually silted and have ceased to supply water. The tenants have no means for excavating new tanks or re-excavating old ones with the result that sources of irrigation are generally becoming scarce and those that still are available only serve a very small area. Increased pressure of the population on land has necessitated the reclamation and cultivation of all areas which used to lie fallow before and though the area under cultivation has considerably increased, sources of irrigation have not kept pace with it, so that the large areas now opened up are entirely dependent on rain for moisture. It therefore happens that crops in large tracts in the districts of Burdwan and in the Presidency Division occasionally suffer from drought and this is impoverishing the tenants year after year.

It is of vital importance that Government in the Agricultural Department should seriously take up the question of irrigation which should form the main item in the activities of the department. It is for the experts to suggest the proper methods of irrigation suitable for this province. Personally I think no one system will be suitable for all districts and the best way is to utilise the existing sources first and then launch on more expensive systems such as canals, etc. Well irrigation is perhaps not very suitable for Bengal. It means an amount of manual labour which the Bengal peasants will not be able to endure. Tanks, canals and streams, are the most suitable.

A good deal can be done by starting irrigation societies on co-operative principles but the surplus resources of the Bengal peasant have fallen so low that it is very difficult for them to find the capital necessary for launching original schemes of irrigation, *e.g.* excavation of tanks, canals, etc. Government should in the first place find the sources of supply and may recover costs afterwards from the people benefited. Much could be done if the people would co-operate and work the existing natural sources but they lack the spirit of co-operation and feel shy of launching any new schemes. In my own village there is a stream which skirts an area of about thousand *bighas* of good land which could be turned into good *dofasli* or twice cropped land if the cultivators would co-operate and throw a dam across the stream to bring the water up to a level suitable for irrigation. But the initiative and the spirit of co-operation are wanting. If the Agricultural Department could take the matter up and after obtaining proper technical advice utilise this source of water, the tenants will gladly pay the costs in instalments.

*Not reprinted.

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It is possible to take up such projects under the Bengal Village Sanitary and Agriculture Improvements Act, but the procedure provided therein is so cumbrous that hardly any projects have yet been started in Bengal under this Act. The main difficulty is the lack of initiative and the want of funds to meet initial expenses. If the Agriculture Department supply these, they will be the saviours of the Bengal peasants.

QUESTION 9.—SOILS.—(*a*) (*i*) In the Burdwan Division great damage is done to agriculture year after year by floods. These inundations are preventible by a proper system of embankment and I consider it the duty of Government to erect them and keep them under repairs. These annual floods have made thousands of cultivators homeless and destitute.

In the districts of Jessore and Nadia, there are many water-logged areas which by proper drainage can be turned into valuable land yielding good crops. There are several schemes for the drainage of these *jhils* before Government but not one has so far completely materialised. The population of these two districts is dwindling very fast and the bad climate of the districts and their poverty have become proverbial. The reclamation of these *jhils* is their only salvation and yet nothing has been done so far. Government ought to take the projects up vigorously and before it is too late.

(*b*) The above conditions in the two districts mentioned above have been brought about by the gradual silting of flowing rivers.

(*c*) If necessary embankments are thrown up, considerable areas in Burdwan and Midnapore which have gone out of cultivation will again be reclaimed. Similarly, if the *jhil* are drainsed by means of canals, large areas will again come under cultivation.

QUESTION 10.—FERTILISERS.—(*c*) By demonstration at first in agricultural farms and then in the villagers' own fields.

(*f*) The use of cowdung cakes as fuel in Bengal is very inconsiderable.

QUESTION 11.—CROPS.—(*a*) (*i*) I do not think there is much scope of improving the main crops grown in Bengal. Something, however, can be done by proper seed selection but a good deal depends on irrigation and manuring and attention should be paid to these two.

(*ii*) The introduction of new crops for areas which are not suitable for ordinary crops like paddy and jute should also be one of the main subjects for investigation by the Agriculture Department. Efforts should be made to popularise crops like maize, castor seeds, ground-nuts, etc., on such lands.

(*iii*) The growing and distribution of seeds should be one of the chief items of work of the agricultural farms. Seed farms can be run very profitably. I know of a private farm at Ranaghat which derives some profits from the sale of seeds through Government agency.

QUESTION 15.—VETERINARY.—(*a*) The Veterinary Department should be under the Director of Agriculture.

(*b*) (*i*) Yes. The system works satisfactorily but the dispensaries suffer from the lack of support and of financial aid.

(*ii*) No.

(*iii*) No.

(*c*) (*i*) Yes.

(*ii*) There are no touring dispensaries as far as I know though the veterinary surgeons go about when there is a report of an epidemic from any quarter.

(*d*) The conservatism of the people is the chief obstacle but this is gradually being overcome. I do not advocate any legislation at present. The people are not averse to advice in such cases.

(*e*) Yes. Very great difficulties. The serum is not promptly supplied and not in sufficient quantities.

(*f*) No other obstacles, except the conservatism of the people and the want of an adequate agency. No fee is charged.

QUESTION 16.—ANIMAL HUSBANDRY.—(*a*) It is in this branch where the Bengal peasant is most negligent. Proper care and feeding of cattle are rare and this fact accounts for the poor specimens of cattle we come across in this province.

(*i*) The chief method of improving the breed of live-stock is to import good stud bulls and make their services easily available to the agriculturists. But the improvement will not be lasting or continuous unless the agriculturists learn to take proper care of the cattle and properly feed them. To rear good cattle the agriculturist should have to raise fodder crops which are practically unknown in Bengal. This is one of the things which can be introduced by proper propaganda and demonstration.

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(*ii*) Dairying as an industry is practically unknown in Bengal. This probably is due to the absence of pasture grounds in the country and want of fodder crops. Stall feeding of milch cows is rare except in towns. The *goalas* who supply milk keep a large number of inferior cows yielding between half a seer to two seers of milk which live by grazing on fallow lands or road-side strips. No selection of milch cows is made and when they grow old and cease to give milk they are sold to butchers. Dairying as an industry is one of the subjects which the Agriculture Department should teach and demonstrate.

(*iii*) The *goalas* and the agriculturists are the only people who rear and keep cows. They sell the calves suitable for agriculture and keep the cows for milk and when the latter grow old, sell them to butchers. The cultivators also keep cows for milk and manure. But the Bengal breed is of a very poor variety due to climate as well as want of proper food and care. Another reason is excessive pressure of the number of cattle on the land specially as pasture is scarce and fodder crops unknown. Those who advocate stoppage of cow-slaughter and cattle export do not realise the economic effect of such measures. As it is, the number of useless cattle is excessive and they cause harm to the useful ones by robbing them of their share of fodder.

(*b*) In most districts of Bengal, there is hardly any recognised common pasture grounds. Owing to pressure of population, the landlords have settled all available cultivated lands with tenants and these are being fast reclaimed. In Eastern Bengal, the lowlying lands which go under water during the rains provide good grazing to the cattle during the cold weather months and the cattle thrive between November and February. For the rest of the year there is hardly any pasture and the cattle get very little to live upon. The plough cattle are stall-fed on meagre allowance of paddy straw and green grass cut from the ridges of fields. In districts bordering on the Bay of Bengal like Backargunj and Noakhali, the cattle are sent to the *char* when the mainland areas are under crops. In Western Bengal districts plots of high land and *sal* jungles afford indifferent grazing. But in most villages the cattle are let loose on the fields and mango groves or banks of tanks from which they pick up what they can get. The plough cattle are stall-fed on paddy straw and oil-cakes. Fodder crops are practically unknown and are nowhere grown in Bengal purely as such.

(*c*) In Western Bengal, the months of February to May afford no green fodder to cattle and in Eastern Bengal the months of June to November are the worst in this respect. There is great dearth of fodder of any sort during the months of June to October generally throughout.

(*d*) The growing of fodder crops is one of the most essential necessities in Bengal and the agriculturists should be encouraged to set apart at least a tenth of their holdings for this purpose. The Agricultural Department should pay particular attention to this matter and instruct the cultivators as to the best methods and the best crop suitable for particular localities. The storage of green fodder should be demonstrated. I have not seen any attempt to do this even in the Government agricultural farms I have come across.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—I have discussed this in my Settlement Report of Jessore and valuable information will be available in the Settlement Reports of other districts.

(*a*) In Western Bengal the busiest season for a cultivator is from June to September when he is engaged in the preparation and sowing of his fields and December to February when paddy is reaped and harvested. In the slack season he manures his fields and repairs his house and those who have *dofasli* lands are engaged in digging for potatoes or pressing sugarcane.

(*b*) The most suitable home industry for the agriculturists is spinning and weaving, preferably the latter, rope-making, poultry-rearing and where climatic conditions are favourable, sericulture. I consider those industries most suitable in which the women-folk can assist. Government can do a great deal to foster and encourage such home industries by sending out itinerant teachers to the villages and by providing raw materials on credit at favourable rates. Government can also establish small factories for carpet-making, lace-making, silk-reeling and lac-making. In suitable centres, Government can afford much relief to the people by starting jute mills and spinning mills and by subsidising small factories for mat-making and paper mills and the like.

(*c*) There are no great obstacles and people are engaged in many places in these home industries. The reason why they are not resorted to on an extensive scale is the ignorance of the people rather than want of resources, and lack of method and industry.

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(*d*) Certainly I do not advocate the establishment of rice-hulling mills as they directly ruin the home industries of the agriculturists and also the health of the people. In fact, I would recommend a taxing of such mills to discourage them.

(*e*) Communication facilities will stand in the way of private industrial concerns moving to rural areas but much can be done to keep the villagers in their homes by Government either starting mills and factories in rural areas or by subsidising them.

(*f*) Yes; I think research on this point is the legitimate work of the Industries Department of Government.

(*g*) If irrigation works such as excavation of tanks and canals are started they will lead to greater employment in rural areas besides being directly beneficial to the agriculturists.

(*h*) Mass education is the only means.

QUESTION 18.—AGRICULTURAL LABOUR.—It is a question of demand and supply. People will migrate to places where they can earn more and they do so now when they find it impossible to find sufficient sustenance in their own homes. Perhaps a little publicity might accelerate migration and Government can adopt measures to this end.

QUESTION 22.—CO-OPERATION.—(*a*) The co-operative movement, though it has made great progress in recent years, has only touched the fringe of the problem, as to how to relieve agricultural indebtedness of the Province. It is therefore essential that everything possible should be done to increase the activities of the department. The two factors necessary to widen its scope are financial aid by Government and non-official propaganda.

(*b*) The type of societies which directly stimulate agriculture are those formed for the purpose of effecting improvements and for the supply of agricultural requirements. Such societies have not yet been established in any considerable number in the Province but the department have now begun to establish them.

(*c*) I certainly think that legislative measures are necessary to compel obstructive persons to acquiesce in measures designed to improve the agricultural and sanitary condition of the villages. It very often happens in Bengal that the recusancy or obstinacy of an individual stands in the way of an improvement likely to lead to the greatest good of the greatest number. Though Government should not ordinarily interfere, there ought to be some legislation which may give necessary authority for effecting an improvement when public utility demands it. I have known of cases where a fractional owner of a silted tank prevents the other co-sharers from re-excavating it or the owner of a plot of land obstructing others from erecting a bund to prevent inundation.

QUESTION 24.—ATTRACTING CAPITAL.—(*a*) Want of agricultural facilities, *e.g.*, irrigation, dearth of labour, want of suitable land in large plots, etc., stands in the way of middle-class people taking to agriculture as a profession. Moreover agriculture does not yield a sufficient dividend on one's outlay and therefore capitalists are not encouraged to invest their money in agricultural concerns. Unemployment among the middle-classes however is becoming more and more acute and young men are now turning their faces towards agriculture. Unless, however, the problems of irrigation and embankment are solved they will not find agriculture paying.

I have personal experience of agricultural conditions and my intention is to settle down as a practical farmer when I retire. I have got sufficient lands and do some cultivation myself. I find however that letting them out on half the produce is more paying than cultivating the lands with my own cattle and by hired servants. The main reason is want of honest labour, the cost of cultivation and the failure of crops brought on by drought and inundation. I think, however, that agriculture can be made to pay if one supervises the operations himself and pays his whole attention to it.

People will begin to take to agriculture when they find that it pays. I think it is worth while for Government to start some willing young men in agricultural enterprise by giving them suitable land or where they have their own land by giving them substantial monetary aid. When I was Collector of Nadia, I made arrangements to experiment with two blocks of lands but was transferred before I could take it up.

(*b*) Want of capital, absence of sufficient return in the shape of increased rent and general lack of interest in the tenants' welfare.

QUESTION 25.—WELFARE OF RURAL POPULATION.—(*a*) The solution is summed up in one word " Education ". Unless the masses are educated it is difficult to expect any improvement in the sanitary and economic conditions in the rural areas.

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(*b*) I do not think any elaborate investigation is necessary. As I have mentioned before, such investigations have been made by Settlement Officers and embodied in their reports.

(*c*) I did make intensive enquiries in the district of Jessore the result of which has been embodied in paragraphs 64 and 65 of my Final Report on the Survey and Settlement Operations in the district of Jessore, 1920-24. The conclusions I have arrived at are briefly as follows :—

64. *Material condition of the people.*—During the course of investigation into the economic condition of the people, out of 1,643 families comprising 10,019 souls inspected, 235 were reported to be in comfort, 552 below comfort, 555 above want, or, in other words, living from hand to mouth, and 331 as starving. Their percentage would work out as follows :—

In comfort	...	...	...	15 per cent.
Below comfort	...	...	...	32 per cent.
Above want	...	...	...	33 per cent.
In want	...	...	...	20 per cent.

The above figures compare very unfavourably with the figures arrived at by the late Major Jack in respect of the Faridpur district. In Faridpur, according to Major Jack, 49 per cent. were in comfort, 28½ per cent. below comfort, 18 per cent. above want, and only 4 per cent. in want. The percentage of persons in actual want in Jessore is just five times that of Faridpur, although the indebtedness in Jessore is not much heavier than that in Faridpur. The indebtedness in Jessore is probably more unequally distributed, and a large proportion of the debts is incurred by the poorer ryots, as is indicated by the enormous number of simple bonds executed every year in Jessore district. This is why the percentage of persons in want is so high. The percentage of people in prosperity cannot also be expected to be higher than 15 in a country in which the average income of the agriculturists, who form 77 per cent. of the population on a most liberal calculation, is only Rs. 54 per head and the annual income of population as a whole is only Rs. 60, which is 25 per cent. less than what the Government thinks necessary to spend on an ordinary convict in jail for his food, clothing, and bedding only. No wonder that the condition of the Jessore peasant is so miserable and his power of recoupment so small. Having no spare capital, he finds himself stranded whenever there is a failure of crops or whenever one out of two heads of cattle dies. He has to borrow at a high rate of interest, the average rate in this district being 25 per cent. And once in debt, he can never extricate himself, and finally becomes a landless labourer. The incidence of debt, which is found to be Rs. 12-2-10 per head and which works out at only one-fourth of the annual income, though it may not appear so, is certainly heavy, considering that the average total value of an individual ryot's stock (which consists of 1½ acres of land, 2/5ths of plough cattle) is not more than Rs. 100. The ryot's indebtedness is more than 12 per cent. of the total value of his land and stock, and as he has practically no savings from which to pay off the capital as well as interest, this cannot but be a matter of great concern. Then, again, it must be remembered that the average income of an agriculturist is Rs. 54 and his debt Rs. 12-2, but this income and debt will vary inversely accordingly as a cultivator is in comfort or in want. The income of the 15 per cent. of the population who are in comfort will probably be Rs. 80 per head and no debts. The 32 per cent. who are below comfort will have an income of Rs. 58 per head and Rs. 8 as debt, the 33 per cent. who are just above want will have an income of Rs. 50 per head and Rs. 12 as debt, and the 20 per cent. who are in want will have an income of Rs. 35 per head and a debt of Rs. 30. It is not therefore difficult to conceive that this last class will rapidly become landless and their proportion will fast increase unless something is done to increase their income to pay off debts.

It is erroneously supposed by men who have not carefully scrutinised the economic condition of the people that the actual cultivators are as a rule prosperous and happy. The middle-class people whose condition is still more deplorable, notice some of the 15 per cent. well-to-do peasants indulge in luxuries which formerly were the monopoly of the upper class, and consider—not without envy—that the peasant class as a rule are getting more prosperous than themselves. They, however, do not consider the condition of the 20 per cent. in want who scarcely get two full meals a day and have scarcely enough clothing to cover their nakedness. It is a fact that 50 years ago, although ill-housed and ill-clad, the ryots of Jessore had no difficulty in getting two full meals, and though their income was small,

their expenditure was less. They used to grow enough food-crops for their subsistence and did not care so much for ready money to buy cheap luxuries as is the case nowadays. Their income has now increased, but this increase is only nominal and not real, as 50 per cent. of them, who cannot sell any paddy at all except for the bare necessaries of life, do not get any benefit from the rise in prices of crops. On the other hand, they have got a higher standard of living and in consequence their expenditure has increased, and not being able to meet their wants with their income, they are gradually getting more and more into debt. Any casual observer who has experience of the Eastern Bengal districts will be at once struck with the general poverty of the average Jessore cultivator. The low-roofed thatched houses of the Jessore cultivator, surrounded by jungle and having a general desolate look about them, and his scanty and ill-fed cattle and live-stock stand out in very unfavourable contrast to the big and airy tin-roofed houses of the Mymensingh or Dacca cultivator, surrounded by his garden and having a general look of prosperity about them. The cultivators of Narail generally, and some of them in Magura and Salkopa are appreciably better off than the rest, but even these cannot come up to the standard of prosperity of the cultivators of Mymensingh and Dacca.

Summary.—The enquiry into the material condition of the people thus discloses that the average gross income of an agriculturist from agricultural produce is Rs. 74, including the income derived from fish and poultry; that his net income is Rs. 54 and his indebtedness works out at Rs. 12-2-10 or 12 per cent. of the total value of his land and cattle; that his average income is just sufficient to keep him above want if he is very economical and provident and if he is satisfied with only the barest necessaries of life; that 20 per cent. of the agriculturists who have already been reduced to very straitened circumstances are dragging on a life of perpetual want and are fast becoming reduced to the position of landless farm labourers.

65. *The landholding classes.*—The majority of the landholding classes which constitute the middlemen *bhadralog* are in severer plight. In Jessore, the number of petty landlords including tenure-holders, is very large, being according to the census of 1911 as many as 116,948 or 6·65 per cent. of the total population. According to the statistics gathered during the settlement operations, the total cash rent paid by ryots to the middlemen is Rs. 36,33,610. The total quantity of arable *khas* lands in the immediate possession of the landlords is 85,915 acres. The net income per acre being Rs. 20, we may assess the total income from *khas* lands at Rs. 17,18,300. The total amount of land let out on produce rent is 17,570 acres, which assessed at Rs. 15 per acre, bring them Rs. 2,63,550. The other sources of income are *nazars* and *abwabs*. The bulk of the *nazars* is the amount paid on transfers of ryoti lands by ryots. The area annually transferred by sale is about 26,000 acres. The average price of an acre in this district being Rs. 50 and the rate of *salami* 25 per cent., we may calculate the *salami* paid at Rs. 12-8-0 per acre transferred, though the landlord does not get more than Rs. 10, the rest going to the agents and *amlas* as *tahari*. The total income from *nazars* will thus be Rs. 2,60,000. Two to six annas per rupee of rent is the general rate of *abwabs*. Taking four annas per rupee as the average, of which half goes to the pockets of the *amlas*, we may guess that the landlords get two annas in the rupee or about Rs. 4½ lakhs in all. The total gross income of the landholders from all sources therefore come to Rs. 63,25,460. Deducting Rs. 8,86,213 as revenue and Rs. 5 lakhs as collection charges, the net income comes to Rs. 49,39,247 in all or Rs. 42 per head, which is even lower than that of an agriculturist. This, however, does not include income from service and profession, as the bulk of the middle-class landholders are dependent on these for their livelihood, it can easily be considered how hard the lot of these middle-class *bhadralog* must be. The average income excluding income from service and profession, per family, comes to Rs. 210 a year, supposing the income is equally divided among the whole class. This is scanty enough. As a matter of fact, however, the income of the majority of the middle-classes is much less, considering that the income of the big landlords of the district is also included in the total income. It is, therefore, easy to understand the great scramble for Government and other services and the all-round struggle for existence.

The income of the landholding classes from the land has been fairly stationary since the time of the Permanent Settlement, rates of rents having increased very little; but the population has increased and so has the cost of living. Nor is there much room for increase in this income from lands in this district, as there is very little unassessed land and the existing rents are hardly capable of being

enhanced. One of the reasons, and a very good reason too, against the commutation of *burga* land is that it will further reduce the income of the *bhadralog* classes. The profession and the services, both Government and private, are not inexhaustible and can only provide for a very small percentage of the indigent middle-classes. The outlook is, therefore, serious in the extreme, and unless new sources of employment and income are tapped, the result in the very near future will be disastrous.

It is evident that if the middle-classes of Jessore wish to survive, they must engage in trade and handicrafts and learn the dignity of manual labour. In recent years they have turned their attention to business, and the prejudice against handicrafts is also slowly dying out. But their lack of training, dearth of capital and want of proper guidance are obstacles in the way of their success.

Oral Evidence

22093. *The Chairman* : Mr. Momen, you are Magistrate-Collector and late Officiating Director of Land Records and Surveys in the Presidency of Bengal?—Yes.

22094. You have been good enough to lay before the Commission a note of the evidence which you wish to give, and we are indebted to you for that. Do you want to say anything in a general way before we proceed to ask you one or two questions?—I would prefer to say anything I may have to say afterwards; not at present.

22095. You are an experienced officer and you have seen the Agricultural Department at work in the mofussil. What do you think about the efficiency of the men engaged in demonstration and propaganda?—They are fairly efficient as far as their training goes, but I do not think they got enough opportunity till recently to show any initiative.

22096. What do you mean when you say "not enough opportunity"?—Heretofore they had not very much chance, because to begin with they had not the people with them.

22097. They have not the people with them?—They had not so far.

22098. Do you mean the people were against them?—Not against them. They are not very willing to co-operate with agricultural officers because perhaps in most places their conservatism leads them to think that it is not likely they can benefit much from their advice.

22099. Would you suggest that the cultivator is over-conservative or that he is just prudent?—He is conservative; I cannot say about the degree of conservatism. He is conservative, but is very willing to take to new inventions.

22100. He is not, financially speaking, in a position to make dangerous experiments? Is that it?—He is not financially in a position to make any experiments.

22101. Would you turn to page 321 of your note to the answer to Question 4. Have you studied this question of the organisation of research closely?—No; I have not. I have mentioned it in a general way; I am not in personal touch with the work.

22102. Do you know anything about the work of the Central Cotton Committee in the matter of research?—No.

22103. Have you studied this question as it applies to America, and this problem as it has been worked out and evolved in America?—No.

22104. On what do you found yourself when you say in answer to Question 4 (*b*), "I do not consider a central all-India scientific organisation necessary"?—What I meant to say was, in the present condition of our Province a central organisation is only an ideal. If we had enough to spare, we could have any amount of organisations. Owing to the financial condition of the Local Government at present, all the money we can get should be diverted to field demonstration and such other things. We must utilise whatever knowledge we have already got, and afterwards we can go further ahead. If the Agricultural Department could get more financial assistance they could do much more useful work. I do not say that an all-India organisation will not be useful, but it can come in after some time, not immediately.

22105. Would you tell the Commission what you think might be the solution of the difficult problem brought about by the use of the main roads by heavy motor vehicles? Is that a problem in the rural districts?—I do not think so, as far as agricultural improvements are concerned.

22106. You do not think the heavy vehicles are wearing the roads?—They do wear the roads to a certain extent, but I do not think they affect the agricultural system of the country. We have got motor vehicles and motor buses running wherever there are roads fit for them in the mofussil, but they are only for passenger traffic.

22107. What do you think is the effect of the motor traffic on the condition of the roads?—The condition of the roads is certainly deteriorating.

22108. And do you think the motor vehicles are making a fair contribution towards the upkeep and cost of the upcountry roads?—They are not.

22109. Have you any proposals to make in that direction?—There was a proposal some time ago for giving power to the District Boards to tax motor vehicles and I supported that idea.

22110. What happened to that?—The Bill has not been passed; it is still under consideration.

22111. *Sir Henry Lawrence*: Cannot licenses be issued by executive action?—The licenses for these buses are issued from Calcutta. They are registered; there is nothing in the Act to prohibit the traffic of these motors.

22112. *The Chairman*: What was this Act designed to do, give powers to local authorities to levy a tax or to give powers to local authorities to prohibit the traffic?—To prohibit and regulate traffic.

22113. *Mr. Gupta*: What Act are you referring to?—The Motor Vehicles Act.

22114. You are not referring to the proposed amendment of the Local Self-Government Act?—No.

22115. *The Chairman*: How would you view a proposal to give power to local authorities to levy a toll?—They ought to have that power. In the district of Bogra, where I was Collector last year, there are no metalled roads at all; all are *kutcha* roads; and they have very much deteriorated on account of the large motor traffic. There is a strong feeling against these motor vehicles being allowed to use those roads without any tax on them.

22116. In what quarters?—Among the people and the members of the District Boards.

22117. How about the condition of roads under the District Boards? Have they deteriorated in recent years?—I think they are deteriorating every year.

22118. Getting worse and worse?—Yes.

22119. How do you account for that deterioration?—My own personal views are that the roads do not now receive as much attention from the District Board authorities as they used to do when there was an official Chairman.

22120. You do not think the District Board authorities attend as closely to these administrative problems as they might?—Especially the communication problem. The income of the District Boards remains practically stationary, and every member has got some special scheme, some tube wells, others extension of medical help, some education, but the communication branch is nearly everywhere starved.

22121. Is there any pressure put upon these Boards by their constituents to pay attentions to the roads?—Very little. The constituents have no means of exercising any pressure; once the members are elected they lose all touch with their constituents.

22122. I gather that you are not very hopeful about the future of these District Boards?—Not unless the Chairman and Vice-Chairman are more energetic and give more time and attention to the affairs of the Boards. At present the non-official Chairman in many districts are either pleaders with large practices or men belonging to other professions, and they cannot give the same amount of time and attention to the Boards that they used to get when the Chairmen were official.

22123. Is there a paid Secretary?—No.

22124. You think it would be better to have a paid Secretary?—I strongly think that there ought to be a paid Secretary. I have known of some districts where the Chairman tours only one or two days in the whole year. He remains away from the district all the time, and the ordinary routine work is done by the Vice-Chairman; the important files are sent to the Chairman wherever he is, either at Darjeeling or Calcutta, and he still continues to be Chairman.

22125. When the time comes and he presents himself before his constituency, is he duly re-elected?—Yes, through other influences; he may be an influential landlord. I do not think the constituencies are sufficiently educated to elect the proper man always.

22126. How large are these District Boards? What is the size of the bodies themselves? What is the number of members?—24 to 32.

22127. Have they any executive body or committee?—They have small committees, the education committee, the finance committee, and so forth.

22128. Do they sit under their own Chairman or under the chairmanship of the Chairman of the District Board?—I think they sit under the Chairman of the Board, but I am not quite sure.

Mr. Gupta: Not now.

22129. *Professor Gangulee*: They have their own Chairman?—I think so.

22130. *Rai Bahadur Bannerji* : While you were District Magistrate of Bogra, were there not official Chairmen of the Boards?—No.

22131. *Prof. Gangulee* : How many of the members are elected and how many nominated?—Not more than one-third of the members are nominated; they are mostly *ex-officio*, like the Civil Surgeon and the Sub-divisional Officers, but the District Magistrate is not a member of the Board.

22132. *The Chairman* : There is no paid officer attached to the District Board? —No, except the clerical staff and the District Board Engineer and Overseers.

22133. *Rai Bahadur Bannerji* : The big District Boards have got their paid Secretaries?—Not in all cases.

22134. *Sir Henry Lawrence* : Who are these Overseers?—They are road Overseers occupying a subordinate position.

22135. *Rai Bahadur Bannerji* : The big District Boards like Burdwan have got paid Secretaries?—Only Burdwan.

22136. Mymensingh has got one, most probably?—I am not sure that it has got one.

22137. All the big District Boards have paid Secretaries?—It may be that two or three District Boards have.

22138. The small District Boards cannot afford to have a paid Secretary?—Out of 26 District Boards perhaps three have them.

22139. *Mr. Gupta* : The Secretaries are not out-door officers; they are entirely in charge of the office?—Yes.

22140. *The Chairman* : Is any inspection of the work of these District Boards carried out by Government?—The District Officers inspect the office once a year, and the Commissioner of the Division inspects it when he visits the place.

22141. *Mr. Gupta* : Do not the Sub-divisional Officers inspect the District?— They inspect only the Local Boards.

22142. *Rai Bahadur Bannerji* : Are not Sub-divisional Officers *ex-officio* nominated members?—Yes they are; not all the Sub-divisional Officers, but most of them.

22143. *The Chairman* : Do you think that your figure of 4·8 acres of holding per family, consisting of 4 persons, which you have given in paragraph 5 of your note on 'Fragmentation of holdings,' is an accurate figure?—It is absolutely accurate for Jessore where I was a Settlement Officer; I worked it out.

22144. How did you work that out; by taking the total number of agriculturists or the total population in the village?—By taking the total agricultural population of the village; I arrived at the figure by taking the total agricultural area which is culturable and dividing it by the agricultural population.

22145. Did you cut out the village community the craftsmen and their families?— Yes; I dealt with the agriculturists in a separate chapter altogether from the other people; I took the population of agriculturists as 77 per cent. of the total.

22146. Of the total agricultural community?—Yes.

22147. I gather that you are not very hopeful about the efficacy of any measures which might be taken to consolidate fragmented holdings in Bengal?— That is so; I do not think it is a practicable proposition at all. As I have suggested, we might do it in a few cases in *khas mahal* land when a new settlement is made, but as a general proposition it is impracticable.

22148. Do you know of the attempts that have been made to bring about consolidation of fragmented holdings on co-operative lines in the Punjab?—I have heard about it.

22149. Have you read about it?—No; an officer from here was sent there for training.

22150. *Professor Gangulee* : For training?—I think so; I had a talk with Mr. Calvert at Delhi.

22151. *The Chairman* : Have you ever noticed amongst the villagers themselves any appreciation of the disadvantages under which they work their holdings?— Yes, they understand it. They know that there is greater demand for a bigger size plot than two or three small plots aggregating to the same size in different localities. I have myself done it by levelling up two or three small plots and making them into a big plot. They understand the value of a big plot in one place.

22152. You do not think that a patient effort over a series of months to persuade one or two villages, carefully chosen, to make this experiment would be successful?—No, I do not think it will be successful, because it is not the actual cultivators alone who are concerned. Consolidation can only be made, as I have submitted, by exchange, or purchase. If there is an exchange, generally it is between two persons, but in the case of an agricultural holding in Bengal there will be about 16 to 20 persons interested in the land, and there must be exchange between each one of them before there can be consolidation, unless of course the State cares to buy up the whole area and reapportion it.

22153. I will leave that point. I observe that under Irrigation, on page 324, you are quite definitely of opinion that a forward move ought to be taken in respect of irrigation in the Presidency?—Decidedly, I think irrigation and drainage are the two most important things and ought to be given precedence over everything else.

22154. *The Raja of Parlakimedi* : In your settlement work, have you come across large areas of waste lands anywhere?—In the district of Jessore, the waste land area, is very little, except those areas which have become water-logged by the action of the rivers being silted up. Rivers which formerly used to flow have now changed their beds and at places they have left big water-logged areas; these areas have ceased to be cultivated; not only the original beds of the rivers, but other areas which used to be drained are no longer drained.

22155. Is that generally the case?—In Jessore and Nadia, there are any number of big *jhilsie* water-logged areas which can be reclaimed if drained.

22156. Are they cultivable?—They will become very fertile lands.

22157. Are there no cultivable waste lands in any of the districts where settlement work has already been done?—In Jalpaiguri, perhaps there are some; in Mymensingh, we have got forests, but it will be very unwise to reclaim that. In West Bengal, there are high lands, *dangas*, in Birbhum and Burdwan districts which may be reclaimed and brought under the plough.

22158. What will be the extent of such land?—In Birbhum and Burdwan the settlement has not been completed.

22159. What will it be in the area you have just mentioned in the other place?—Water-logged areas?

22160. You said that in some districts settlement work has been done; how much will it be in that district?—In Jalpaiguri, there may be something like 150 square miles of it.

22161. Why has it not been taken up for cultivation?—Formerly, Jalpaiguri was rather thinly populated; gradually it is being taken up.

22162. What is the usual procedure to be adopted for a ryot to get the land?—He approaches the landlord.

22163. Is it zamindari area?—Mostly zamindari; there is some *khas mahal* land also, but that also is let out to big *jotdars*.

22164. Do they demand any premium?—The private zamindars demand a premium.

22165. What is the practice in ryotwari areas?—We have got very little of what is known as *khas mahal* land in Bengal. That which is not permanently settled, but directly ryotwari settled, is called *khas mahal* land in Bengal.

22166. If in ryotwari areas, there was cultivable waste land, and a ryot applied for a *patta* on that piece of land. what would be the premium charged?—There is very little premium charged by Government. Up to now we have never realised any premium for settling new lands in *chars* and other areas.

22167. What would be the premium if it was situated in a thickly populated area?—There is very little of *khas mahal* land except in Noakhali where the big *chars* are, but there is very great demand because the pressure of the population on the land is very high, 900 to the square mile.

22168. What is the procedure adopted?—A large number of applications are received by the Collector; he enquires into them, and gives these lands to those who are most deserving, that is, to those whose lands have been washed away, or who were *khas mahal* tenants, or who have not enough land to maintain themselves; the policy is to give it to the actual cultivators.

22169. To the neighbouring cultivators?—To those who are actually of that class.

22170. If there are cultivators in the neighbourhood, is it not given to them?—Preference is given to them.

22171. What is the premium charged?—No premium is charged.

22172. Are such lands ever put up to auction?—Never; no settlement is done in Bengal by auction; all is done by selection of tenants.

22173. In your settlement work have you found encroachment by the cultivators upon neighbouring lands? Suppose there was a big field bund between two cultivators' lands, or a communal *poramboke*, that is to say, a piece of land set apart as a communal threshing floor, would they encroach upon it?—There is no such land in Bengal, what you call common land or common pasture ground, or communal land, belonging to the community.

22174. How do they manage it?—Everybody has his own threshing ground, mostly in the courtyard of his own house.

22175. Is that included in the *patta*?—That is part of his holding, he pays rent for it.

22176. During your tours, have you found by-industries being taken up?—They do a little industry also. It is however on a small scale and is not done everywhere. Some people, for instance, do poultry raising and some basket work.

22177. Which is most popular?—It depends on the locality. In some districts where the population is mostly Mahommedan, everyone has got some poultry.

22178. Is not silk-rearing popular?—In Malda it was very popular at one time but the industry did not flourish. The Government are now trying to improve it.

22179. What is the reason of the progress of the industry being retarded?—Perhaps foreign competition; I am not an expert on it.

22180. It is not due to the diseases of silk worms?—The diseases of cocoons are also responsible for hindering the progress of the silk industry but now Government sericultural farms are supplying cocoons.

22181. What work do the co-operative societies generally take up apart from moneylending and so on?—Their activities are now being enlarged and they are now taking interest in every branch. They are trying jute purchase and sale societies in Serajganj. In Bankura, they have agricultural co-operative societies; they have sale and purchase societies in some places, but the number is very small. As I have said, the Co-operative Department has only touches the fringe of the question.

22182. Can you put your ideas more clearly as to what you actually want from the Co-operative Department?—The number of societies should be increased. The ideal should be that each Union Board should have a Central Bank. We have got Central Banks in district headquarters and sometimes in sub-divisional headquarters but they ought to be in every Union. A Union is about ten to fifteen square miles in area.

22183. How many societies will there be?—There ought to be ten societies, one in each village.

22184. Have you any suggestions to make as regards auditing?—It is too technical a subject for me to offer any suggestions. I do not know the details of the work.

22185. As far as your knowledge goes, are you satisfied with the work that is being done about the accounts and so on?—I think the auditing is perhaps the chief work that they are doing. I would rather have more propaganda and more organisation than auditing.

22186. We have been hearing that it is a thing which is very badly needed?—Perhaps the staff is not enough. I could not tell you as I have no personal experience of it.

22187. Have you had any knowledge of the villagers complaining that they do not receive proper attention when they go to the office of the co-operative societies?—No. As a matter of fact, in a village all the villagers are not members of the co-operative society. Only about 15 or 20 are members of it.

22188. How are they selected?—The villagers form into a society and then gradually the organisers of that society enlarge the membership. But, as yet, we have not got all the possible members to form these co-operative societies.

22189. Does caste act as an obstacle for selection? Have such people as *panchamas* any difficulty in getting into the society?—We have not got any *panchamas* here and there is no difficulty on the score of caste.

22190. Suppose a member of a low caste is taken into the society will there be any objection to it?—We do not make any difference at all about castes.

22191. Do these co-operative societies take up animal husbandry also?—They have not taken it up so far as I know.

22192. Do you not think it would be a good thing if they did so?—Animal husbandry is a most important subject and the Department of Agriculture have neglected it so far.

22193. So, in your opinion, it would be a good thing if the co-operative societies took up animal husbandry?—If the co-operative societies could keep good bulls, or breed good cattle, or arrange for the milk to be collected and sold, they would do immense good.

22194. As regards demonstration, do you prefer its being done in the field of the cultivator or done on separate areas?—It should be done in both ways. The ideal ought to be that we should have a demonstration farm in every Union and in addition to this there ought to be demonstration in the cultivators' own fields.

22195. You wish to have the number of demonstrators increased?—Yes; both of demonstrators and agricultural officers.

22196. How many demonstrators are there in this Presidency per district?—In Bogra, there were four or five demonstrators. I am not sure of the number now but there are not enough by any means.

22197. So far as you know, four is the highest number?—In Bogra there were four or five. In some districts there are no agricultural farms and also no demonstration farms, and demonstration without a farm is not very satisfactory.

22198. *Sir James MacKenna*: I should like to know what the opinion expressed by you in replying to Question 3 on page 321 is based on?—It is based on my own personal knowledge as a layman and also on the experience I have had in several districts where I have worked. It is also based on my own experience as a small cultivator.

22199. Have you visited any of the agricultural stations in the Presidency?—I have visited only the farms in those districts in which I was a Collector. I have visited the Jessore farm and I have seen the Bogra farm.

22200. Have you visited Dacca?—No.

22201. Do you not think that this is rather a severe stricture on an important department of the Government by an officer holding a responsible position like yourself?—I have said what the people think. I have given the reason for its unpopularity. Are you referring to that portion of my statement on page 322 where I have said that the Agricultural Department is not popular?

22202. I am prepared to say that there are a large number of gross inaccuracies in your statement?—There may perhaps be one or two inaccuracies.

22203. You have a full sense of responsibility and still you maintain that this is your considered opinion?—Unless you tell me the portion to which you are referring I cannot say one way or the other.

22204. I am afraid it will take a long time; I have marked several passages?—The only objectionable portion perhaps is the place where I have said that the Agricultural Department is unpopular with the people. I have however given my reasons for its unpopularity. Of course, it is not possible for the department to show tangible results in a short time.

22205. *Professor Gangulee*: You are familiar with the Department of Agriculture more on its organisation side than on its research side?—That is so. I have not got much personal knowledge of research work.

22206. As an officer you have been in touch with rural life for a considerable time. May I know what particular aspect of the rural problem attracted your attention most?—You mean the agricultural side?

22207. All its sides?—In the agricultural branch, I think the failure of the crop on account of drought is the most noticeable.

22208. Perhaps you have not understood me. You have been a Settlement Officer, a District Officer and also Director of Land Records. I want to know what particular aspects of rural problems attracted your attention most. Is it

agriculture, or improvement of sanitation, or better roads, or agricultural education, or what?—The thing that attracted my attention was the agricultural and the economic position of the agriculturists.

22209. So you were concerned with the development of agriculture and the economic position of the agriculturists. Therefore I cannot reconcile these two facts, namely, your interest in agriculture and in agricultural improvement and your not taking adequate interest in the Department of Agriculture itself?—I had no opportunity of taking any interest in the scientific side of the Agricultural Department.

22210. Have you been in any area where better seeds were in demand?—Everywhere better seeds are in demand and they are supplied as far as possible by the Agricultural Department.

22211. Has at any time any part of the rural population come to you for any information with regard to better manure?—No.

22212. You refer in your statement to the Union Boards. You say that Union Boards under the guidance of the Collector of the district ought to take more interest than they do at present. Do you consider the Union Board to be a unit of organisation suitable for rural reconstruction?—Very suitable.

22213. Are you in touch with any Union Board?—As a Collector, I am in touch with every Union Board.

22214. You think that the Union Board as a unit of organisation can undertake the task of rural reconstruction?—Yes. In fact, that is the body which ought to take up this rural reconstruction work more effectively than anybody else.

22215. You also emphasise the importance of the Collector taking more interest than he does at present?—I mean he should take more interest in agriculture.

22216. Do you mean to suggest that they do not take interest now?—They do. Some of them do take interest and some of them do not. They ought to take more interest.

22217. You were a Collector yourself. Did you not take any interest in agriculture yourself?—I took very great interest in agricultural farms wherever I could.

22218. Did you take interest in Jessore farm?—I was not a Collector there; I was a Settlement Officer; I had nothing to do with the agricultural farm there.

22219. As a Collector, did you come in contact with the District Agricultural Officers?—Yes.

22220. Could you tell us something about the work done by these District Agricultural Officers?—I asked some of them what work they were doing actually. They said that they went about in the village, talked to the people, did propaganda work and tried to instil in their minds the usefulness of the improved seeds which are supplied by Government and so forth. I understand instructions have now been given by the Director of Agriculture laying down their duties properly.

22221. I understand that, but I want to know what your relationship was with the District Agricultural Officer in the district where you were Collector?—More or less advisory; Collectors do not have control over them.

22222. What assistance did you give to the District Agricultural Officer?—No particular assistance, but if I was asked to assist, say in the way of helping them to acquire land and so on, I did so.

22223. Did you accompany them to any demonstration farm?—Yes, I used often to visit the agricultural farm at Jessore and Bogra. Whenever the Deputy Director came, I always accompanied him.

22224. Were you present at any demonstration yourself?—The demonstrations were done in the fields. They sow seed in the field of some cultivator and afterwards come and visit it. I never went with them and I do not think people were ever invited.

22225. You did not go with the District Agricultural Officer to attend any of these demonstrations?—No.

22226. Did you take an interest in agricultural education?—A general sort of interest.

22227. Is there any school in your district of that kind?—No.

22228. Are you in favour of agriculture being taught in secondary schools?—I am in favour of having some vocational subject in each secondary school.

22229. Have you given any special thought to these problems?—I tried to do so when I was Collector of Nadia. There is one school started by a gentleman there which has one vocational compulsory subject attached to the ordinary curriculum, and agriculture is one of them.

22230. What has happened to that school?—It has only just been started; I do not know how it is progressing.

22231. You are not in touch with it now?—No.

22232. Are you in touch with any co-operative societies here?—Not now; not as Director of Land Records. As Collector, I was in touch with them.

22233. Have you any criticisms to offer upon the working of the co-operative societies?—I am not in a position to criticise.

22234. You are not aware of the details?—They are doing useful work and are well spoken of everywhere.

22235. You have not closely studied the movement?—No.

22236. Have you any experience of sale societies?—No. They are being started now, but it is a new thing here.

22237. In your work as Settlement Officer you must have come in touch with both landlords and tenants. Can you tell us what the relationship is between landlords and tenants in this Presidency?—There is a lack of sympathy, or perhaps I should say a lack of interest, on the part of many landlords, and especially the big landlords, who are mostly non-resident.

22238. Absentee landlords?—Yes.

22239. You are aware of the existence of the Land Improvement Act?—Yes.

22240. Do you think the Bengal peasant is able to derive any benefit from this Act?—He is capable of doing so, but as a rule the peasants do not take advantage of it.

22241. Why?—They can take the land improvement loans, but there are so many difficulties in the way. First they have to apply for the loan, and then there is an inquiry by a Government official and then they have to give proper security for the loan. That is the chief obstacle; there is not enough security offered by rural property. The people who generally apply for these loans are those who want to excavate tanks and so on but there again the difficulty is that the amount we generally recommend is not sufficient; and once they take the money of Government no moneylender will lend them any money.

22242. You refer in your note to agricultural income being this and that. How do you define " agricultural income "?—The income which is derived from cultivating the land, from the produce of agriculture. I do not include any income obtained from rents for agricultural land.

22243. These figures were obtained from your Jessore settlement survey?—It was a very easy matter in some ways. You know the actual total area under crops, and also what the average yield is per acre with a given crop.

22244. *Mr. Calvert*: Do you?—Roughly. You can never be exact in these things.

22245. Within 30 per cent.?—It depends on the personal equation of the man who does it. You also know the total value.

22246. *Professor Gangulee*: That is the way you do it?—Yes, and I made an inquiry in the case of several typical villages and got typical budgets, and compared the results.

22247. Could you give us one of your account sheets, showing all the details of how you arrive at the figures given here?—They are contained in my settlement report of Jessore. All the details are given there. On page 68 you will find a budget showing actual income and expenditure, and in another place you will find the actual value of the crops and so on. On comparing the two figures it will be found that they come to very much the same.

22248. *Mr. Calvert*: I gather you think all the economic information which could be wanted has already been obtained by the Settlement Officers, and is available?—I think so.

22249. I am glad to meet you; you will be able to answer all my questions. Can you tell us roughly what is the average cultivated area per cultivator, whether as owner or tenant?—As tenant I have said it is 1·2 acres.

22250. That is the net cultivated area per cultivator, whether he cultivates the land as owner or tenant?—It is nearly all ryots land.

22251. Do not your owners also take on land as tenants?—People who own land may also take on some as tenants?

22252. A man may be the owner of one piece of land and the tenant of another? —Owner as a proprietor?

22253. Yes?—Proprietors' land is not taken into consideration in this; it is only land which is cultivated and held by people who pay rent to another.

22254. These figures are for average holdings of tenants of owners?—Yes, and that covers practically all the land. None of the Jessore landlords cultivate land themselves.

22255. Have you in the course of your settlement work worked out the costs of cultivating an acre of paddy, for example?—Yes, and I have given that in my report. I worked it out for every crop, including sugarcane and so on.

22256. They include the labour costs of the cultivator and his family?—Yes.

22257. Have you attempted to check your estimates of outturn of paddy by consumption? Have you also estimated the consumption of the people?—I have calculated the consumption on the jail figures.

22258. They are not quite the same; a man in confinement requires more food than a man who is free?—I do not think so; a man in jail is not really confined in that sense.

22259. A man in jail has to have more food to maintain his bodily weight than a man who is free. The consumption of a person outside jails is less than that of a man in jail?—No, I do not think so. In Bengal the cultivators take much more than we allow the convicts. It may not be good for them but they do take much more.

22260. *Dr. Hyder*: Have you ever found in your experience as a Magistrate whether the people who go to jail gain in weight?—Yes, they always do.

22261. *Mr. Calvert*: You suggest a kind of system of compulsory thrift of, I think, one anna per bigha?—Yes.

22262. Is that your own idea, or did you base it on the French system?—It is my own idea entirely. It will not find favour with the people in Bengal generally. Everybody wants the Government to finance this and that, but Government's resources are not unlimited, and therefore I suggested there should be this contribution from landlords and tenants and that the money should be kept in the district as a permanent land improvement fund.

22263. You do not know whether a similar compulsory contribution taken in the French colonies has proved a success?—No.

22264. You are not very much in favour of popularising the *taccavi* loan?—No. It will not be necessary if there is an improvement fund.

22265. Yet you favour a new type of *taccavi* loan for industries?—Yes, that is special; but the source may be from that land improvement fund if there is one, or otherwise from Government.

22266. In the first case you are not in favour of popularising *taccavi* and in the second case you say Government can do a great deal to foster and encourage home industries by providing raw material on credit?—That is a special side. It is not possible to make the ordinary *taccavi* which is now being given very popular, because the officers who have to make inquiries have responsibilities and they are over cautious. It is not possible to be very liberal with those loans.

22267. Then I come to agricultural indebtedness. Have you read Mr. Darling's book on the Punjab Peasant?—No.

22268. When you talk of average annual income, I presume you refer to money income; you have not calculated the supplementals?—What are the supplementals?

22269. A certain amount of free grazing, free house site, free water?—I have calculated the income from all the subsidiary industries which the ordinary agriculturist engages in.

22270. Have you calculated the income from vegetables grown in the fields?— It is not much in Bengal. I have seen it in Bihar in my early days. In Bengal the subsidiary income is from fish and from poultry.

22271. You say that a large proportion of the peasantry " cannot afford to have even the bare necessities of life." How do they manage to live without the bare necessities of life?—They do not have the many necessary things that people ought to have, but still they live.

22272. On page 329, you say that people are " getting more and more into debt?"—Yes, they are.

22273. Can you let us know why does the moneylender go on lending money?—Because he gets interest.

22274. They do pay interest?—Yes.

22275. You suggest that he cannot pay interest and the debt is getting worse and worse?—They cannot pay the interest in time, but ultimately the principal and interest are realised from them by getting a decree in the courts and selling their lands.

22276. The moneylender invests his money in order to get interest?—Yes, to increase his capital. Although the moneylender does not get the interest in time, eventually he realises the principal and interest.

22277. *The Raja of Parlakimedi*: Does he get the ryot's land as a mortgage before lending the money?—Yes, mortgages are very common.

22278. *Mr. Calvert*: On page 323 you say, " The ryot's land not being transferable by law his credit is very small," and yet you say, " Lands are freely transferred "?—It is freely transferred, but the law does not make it valid. Therefore there is now a proposal to alter the law in connection with the amendment of the Tenancy Act.

22279. Has not your economic investigation led you to the conclusion that one of the basic causes of debt is credit?—One of the basic causes of debt is want of credit.

22280. Is credit?—I do not know.

22281. You cannot borrow without any credit?—They do borrow without credit; many people do it.

22282. *Professor Gangulee*: Would you lend me Rs. 1,000 if I had no credit?—No, but if I had more money then I knew what to do with, in a moment of weakness I might do it.

22283. *Mr. Calvert*: Do you say the moneylenders of Bengal advance money to bankrupts?—They have a credit. The moneylenders know that in the end they will get the land. But there is always the risk of the landlord not sanctioning the transfer, and it is because of that risk the mortgagor gets much smaller credit than he would otherwise get.

22284. Do your economic investigations suggest that the amount of money advanced on land depends upon the price of that land?—Yes.

22285. And as the land rises in value, the mortgage debt tends to rise too?—The amount that the man can get is certainly more.

22286. Naturally he gets more into debt if the value of the land rises higher?—Yes.

22287. So that, debt does follow credit?—If the value of the land rises, he can get the loan he requires by mortgaging a smaller area of his land. If he wants Rs. 60, he has now to mortgage three *bighas*. The moneylender pays this now because he knows that eventually by payment of *salami* and so forth he can get the land himself. If the land is freely transferable the cultivator can get Rs. 60 by mortgaging only one *bigha* instead of three *bighas*.

22288. Under the head " Crops " you say, " I do not think there is much scope for improving the main crops grown in Bengal." On a previous page you appeal to us to face facts and not follow theories?—That is about education of agriculturists.

22289. What is this statement, theory or fact?—I was speaking only comparatively. You can certainly improve every crop, but the cost of manure and labour will stand in the way. I do not say that there is no possibility of improving the yield of paddy. But we should not give all our attention to the improvement of seed and better manuring. There are other methods which I suggest will appeal to the people more, such as irrigation and drainage.

22290. If we can give the cultivator an improved strain of paddy which will give him 30 per cent. more yield than the ordinary paddy, would you not call it a substantial improvement?—What about the cost of cultivation?

22291. The same?—There is not much scope.

22292. You say that the ryot once in debt can never extricate himself and finally becomes a landless labourer?—Yes, as things stand at present.

22293 .Do you regard that decline into the state of landless labourer as a desirable thing?—It is undesirable.

22294. And you would not use the sources of relief afforded by the Imperial Legislature such as the Usurious Loans Act or the Insolvency Act?—The intention of those Acts is very good. What I say is that the people can always circumvent those Acts; in actual practice they defeat the purpose of the law.

22295. What is your suggestion to amend the law, or to let things remain as they are?—To reduce the rate of interest by starting co-operative banks, and to gradually free them from debt.

22296. Further down the same page you say that the ryots have now got a higher standard of living and they are gradually getting more and more into debt. Do you mean that they raise their standard by borrowing?—No, in some years they get bumper crops in jute areas chiefly; then they expect that they will get it every year, and they spend freely.

22297. You mention about these people " dragging on a life of perpetual want." Are they so poor that they cannot afford to get married?—Marriage does not cost very much in every society.

22298. *The Chairman* : Your experience has been fortunate in that respect?—I do not mean the ultimate effect of it, but I mean marriage itself.

22299. *Mr. Calvert* : Do you know that in England millions of people are too poor to marry? You have not got to that stage?—It depends upon the nature of the society, the sort of wives they get.

22300. In England some people are extremely poor and they cannot afford to get married?—Marriage is sometimes a sort of help here. The wife does as much agricultural work as the man himself.

22301. You regard expenditure on marriage as productive expenditure?—Sometimes it is.

22302. *Sir Henry Lawrence* : Do women work in the fields here?—Not the Mahommedan cultivator women, but the lower caste women do work.

22303. In a separate paper, you say that the average holding in Jessore is 4·8 acres?—I do not mean holding as defined in the Tenancy Act, but the total land held by the family.

22304. You say the average size of a plot is 36 acres. That gives 14 to 15 plots per holding. Would these separate plots be in separate places?—Yes.

22305. That is, the fragmentation would be 14 or 15 plots per holding?—That is true.

22306. Would you not attempt to remedy this?—I would attempt it, but I am not at all hopeful that we should succeed in doing it.

22307. You are not optimistic about improving the crops of Bengal?—Not optimistic of being able to consolidate holdings by exchange.

22308. You seem to get very pessimistic all round, on the question of crops, fragmentation of holdings, debt?—Perhaps experience makes one pessimistic in this country.

22309. We want ideas from you as to how we can improve the position. Can you give any ideas?—I say it is not practical, but I have given remedies that might be tried in a small way and see what happens. I may be wrong, but they may be tried.

22310. Can you offer for our consideration any suggestions as to how to improve the economic position of the poor people of Bengal?—We might try to increase the produce from land.

22311. But you say you cannot improve the crops of Bengal?—I do not say that. I say along with that other things should be tried, such as proper education, drainage and irrigation and these things will give you improved crops. I have said that in one place. You can improve the crops certainly, but what I mean is

that the subjects I mention must receive first attention, and that you can improve in other directions later on.

22312. We have been told that the Bengal ryot is too proud to be seen cutting his own paddy in his village; he will go further away and work as a labourer, but he will not employ himself as a labourer in his own village?—That is not true. In Barisal and other places, they work in the fields and grow their crops, but at the time of harvesting other people come in and help them.

22313. *Professor Gangulee*: Why?—Because that is the custom with them.

22314. *Mr. Calvert*: They do not cut themselves; they get other people to cut their own paddy?—That is not the case.

22315. One of your fellow Collectors made that statement?—I do not know who made that statement, but that is not correct.

22316. We were told that the poor people would not be seen hoeing their own fields?—That has not been my own experience.

22317. *Mr. Kamat*: In your statement, you have passed a rather severe indictment, as one of my colleagues suggested, against the Agricultural Department, and I should like to ask you the grounds on which your impressions are based?—If you will let me know which particular portion you refer to, I shall try to reply.

22318. On page 321 you say, "I have known few District Agricultural Officers who take that amount of personal interest in the work that they should." Do they not take any personal interest?—Perhaps, the cases I have in mind may have been the exceptions, but the officers whom I have seen did not appear to take that amount of interest which I think they ought to take.

22319. On page 322 you say, "The Deputy Directors seldom meet the agriculturists and come and go unnoticed. I have known officers coming to districts for inspection work but not travelling beyond the railway station". Is that a general proposition?—That is only for one officer, but in some districts I have found that the visit of these officers is not very well known.

22320. You have observed one instance, and on that you make this general statement?—I do not put it forward as a general statement; I mention it as an example.

22321. Your statement applies to the generality of them?—I have seen one officer to whom it applies.

22322. The Deputy Directors, as a class, are not as bad as I thought them to be, from this remark of yours?—Perhaps, it is a little over-stated. What I mean to say is that they do not leave behind them that impression, or make that impression which they ought to.

22323. Then you say, "The agricultural farms I have seen are all run at a loss". Is that so?—That is true.

22324. All of them?—The two or three that I have seen are run at a loss. In my book I have given the actual statistics regarding the agricultural farm at Jessore, which go to show that there is no return from the farm.

22325. In your memorandum you say, "The agricultural farms I have seen are all run at a loss"?—They are.

22326. You have seen two or three of them?—I have seen the one at Jessore and the one at Bogra.

22327. Were they losing concerns?—Yes.

22328. *Professor Gangulee*: Have you examined their accounts?—Yes. I have printed it in the book; they are from their own reports. What I was driving at was that you should have a demonstration farm which would appear to the ordinary people as a paying proposition.

22329. *Mr. Kamat*: When you say that the Agricultural Service is perhaps top-heavy, what was the idea in your mind?—That was with regard to the number of agricultural officers; they have been reduced from the bottom.

22330. And yet you say it is top-heavy?—In comparison with the lower agricultural officers, the top is heavy. I say that the number of agricultural officers ought to be increased.

22331. What is wrong at the top?—I refer to such posts as Deputy Directors of Agriculture and similar high posts.

22332. *Professor Gangulee*: How many Deputy Directors have you?—Four or five.

22333. *Mr. Kamat* : Do you take that to be a very large number for your Presidency?—They are not too many, but at present they have reduced the number of District Agricultural Officers. What I mean is that their number has been reduced, whereas the superior officers have not been reduced.

22334. On the contrary, that goes against your statement; you were saying that there was something wrong at the top; the District Agricultural Officers are at the bottom?—That is so.

22335. There must be something wrong for you to justify your statement that the department is top-heavy?

Rai Bahadur Bannerji : The number of Deputy Directors is three.

22336. *Mr. Kamat* : Are three too many for your Province?—Perhaps they are not; perhaps what I have said is not quite correct.

22337. Therefore, your statement that the department is top-heavy is not correct?—I do not think it is so at present.

22338. As regards agricultural economics, I suppose the Settlement Report is of recent date?—It is 1922 or 1923.

22339. It was published in 1925?—It was published later on, but it was written in 1923.

22340. Has it been adopted by Government, or has any Government Resolution been passed on it?—I have stated it in the note.

22341. Have they accepted your conclusion?—They do not accept anything.

22342. They have not given a general acceptance to your conclusion?—No.

22343. You have carried on these economic enquiries only in one district?—Yes, but there are other Settlement Officers who have done so in other districts.

22344. Similar enquiries with reference to other districts have not been done?—They have been done.

22345. Any conclusion about the economic condition of the villagers is based, therefore, not only on one district or three districts, but on more districts?—It is based on enquiries with reference to 15 districts. In time, we will have that information regarding all districts in Bengal.

22346. In this report you say that more than half a century ago the condition of the cultivator was more affluent. Is that quite correct?—Yes, so far as the actual necessaries of life are concerned.

22347. You say that the cultivator was a little better off in the early seventies than he is now. You have given us the figure of the average income of the agriculturist at the present day as Rs. 54, whereas you say that in 1872 it was Rs. 62-8-0. Was that net income?—It was net income from agriculture.

22348. That is to say, deducting all costs of cultivation?—Yes.

22349. His present income, you say, is about Rs. 54?—For Jessore.

22350. His income is calculated on the cost of the produce at the present day, either for jute or for paddy?—Yes.

22351. Will you tell me what was the average price of these staple crops 50 years ago?—I took the figures from the statistics collected at that time by a particular officer; I took them from Mr. Ramshankar Sen's book. The whole thing is based on the value of the produce as given in Mr. Ramshankar Sen's book.

22352. Was Mr. Ramshankar Sen a Government officer?—Yes; he was Subdivisional Officer of Magura when he wrote that book.

22353. His book and the prices quoted in it were official?—He wrote that book in his official capacity.

22454. Were the bases of prices taken then, and taken by you now, official?—They are official in this sense that the book is written by an official.

22355. Was there any official authority behind the figures quoted by Mr. Ramshankar Sen in 1872?—I could not say whether it was so.

22356. If the prices taken then were only prices which had no official authority, but were prices quoted in the bazar, then the two things are not comparable at all?—What is official authority?

22357. The Agricultural Department has got a publication giving the schedule of prices?—They are giving the prices of staple crops like paddy, not the price of everything.

22358. For purposes of comparison, we take those prices as the ruling prices, not the prices quoted in the bazar?—I do not know from where Mr. Ramshankar Sen took his prices; those are the figures in his book.

22359. In your statement you also give figures of expenditure of the agriculturist; is this based on your enquiries only in one village?—No, many villages. The figures were compiled from the reports of Circle Officers. There were about 40 Circle Officers who made these enquiries; they gave me the figures on those particular heads and I compiled them.

22360. You think there is no reason to believe that the expenditure shown is over-stated?—I do not think so.

22361. *Dr. Hyder* : How many villages did you have, 50?—That was an economic enquiry which I conducted separately. This relates to figures of agricultural expenditure, which I gathered from Circle Officers.

22362. *Mr. Kamat* : In this report of yours you also state that the lands used to produce at least 50 per cent. more crops in 1872. Is that again a statement borrowed from Mr. Ramshankar Sen's book?—Yes.

22563. Was there any detailed enquiry or official authority for the statement that the lands used to produce 50 per cent. more than they are doing now?—I could not tell you.

22364. That may vitiate or throw out the whole of your present enquiry?—Quite possibly.

22365. With regard to fragmentation of holdings, you do not pin your faith to legislative measures?—No, except, as I have suggested, in a small way to deal with obstructive people.

22366. Is that impression based upon the fact that you have a permanent settlement here, and 90 per cent. of the land cannot be interfered with by Government?—Yes, Government have got absolutely no power to interfere.

22367. Talking about well irrigation, on page 324 you say, " Well irrigation is perhaps not very suitable for Bengal. It means an amount of manual labour which the Bengal peasants will not be able to endure." In other Provinces there is any amount of well irrigation, and the peasant will cheerfully do it. Do you mean to say that the Bengali peasant is so degenerate as all that?—Our experience is that when the District Boards propose to dig wells on the road side, people say " We will take the water," but when the wells are dug, they will not use them because they are not accustomed to drawing the water.

22368. It is rather an extraordinary phenomenon for us to observe?—It may seem extraordinary, but there is the trouble of raising the water; the people here are accustomed to dip their vessels in the tank and take the water; besides, it is the women who generally carry the water, and they do not like to come out.

22369. On pages 326 and 327, you advocate certain measures which Government should adopt to promote home industries. You also say, " Government can also establish small factories for carpet-making, lace-making, silk-reeling and lac-making." Do you mean to say that this should be done without finding out whether these are paying concerns and business propositions?—They ought to be paying concerns, but to whom, to the Government?

22370. To the man whom Government will finance?—Government ought to find out whether it will pay.

22371. The first step is to find out whether it will pay or not?—Yes.

22372. Unless they do that, it is no use starting a carpet-making industry?—No.

22373. You also say, " In suitable centres Government can afford much relief to the people by starting jute mills and spinning mills." Is that a legitimate policy for Government?—I do not know whether it is legitimate or not. I think that perhaps it might help in attracting the local people.

22374. Is jute milling a cottage industry?—It is not; I have put it in a separate sentence for that reason.

22375. *Rai Bahadur Bannerji* : You have been telling us this morning that consolidation of holdings is impracticable in Bengal, and I want to ask you a question about it. In Bengal, the zamindar, or the *patnidar*, or the *darpatnidar*, or whoever he may be, is in actual possession of the land, and from him these tenures are held by the different ryots?— .....

Sir Ganga Ram : May I ask you how many " *dars* " there are in Bengal?

Rai Bahadur Bannerji: Quite a number. You have the zamindar, who holds the land direct from the Government by paying the Government revenue; next comes the *patnidar*; the zamindar gives a sort of permanent lease to the *patnidar*.

22376. *Sir Ganga Ram*: He cannot be turned out?

Rai Bahadur Bannerji: No, if he pays rent; next comes the *darpatnidar*.

22377. *Professor Gangulee*: Do you propose to give him the whole series?

Rai Bahadur Bannerji: If he wants them; there is also the *shepatnidar*, and generally we have the *izardar*; nothing more.

22378. Whenever there is a transference of land from one tenant to another, the zamindar, or the *patnidar*, or the *darpatnidar* or the *izardar* gets a share of the sale money, the mutation fee as you call it, which is generally 25 per cent.?—He does not get a share; he gets an additional *salami* for recognition of the purchase.

22379. *Salami* for recognition?—Yes; it varies from 25 per cent. to anything.

22380. To anything which can be settled between the zamindar and the *ryot;* but there is no dispute that generally it is 25 per cent.?—No. He does not get a share but gets an additional *salami* for recognition of the purchase.

22381. If the tenants once understand the benefits of consolidation, they have merely to exchange their lands and can satisfy the zamindar by payment of the *salami* he wants?—This can be done if there is only one zamindar.

22382. Even if there are three different men, what does it matter?—There will be difficulty if the two plots belong to two people. For instance, the *patnidar* may be the common man but the zamindars may be two different men. In that case it is not possible unless you take the consent of the whole lot in the chain.

22383. Is it not a fact that once the thing is leased out, the zamindar has nothing to do with it?—He does not derive much benefit from it.

22384. He gets only settled revenue and nothing else?—Yes; but by exchanging the land they cannot alter the nature of it so far as different estates are concerned.

22385. I shall give you a concrete example?—I have mentioned that in my note. I have referred to your case.

22386. If it has been practicable in my case why should it not be practicable in other cases?—Everybody has not got your influence and money.

22387. It is not a question of money because I have never paid for any land?—Then it is a matter of influence.

22388. That is being done in other villages where people have not got the same amount of influence as I am supposed to have?—I thought it was impossible. It may be possible in one or two cases in Birbhum perhaps; but in Eastern Bengal it is absolutely impossible.

22389. May I inquire if it has been possible in some case or cases or in some villages in some districts? If the Government comes to our help with some necessary legislation, do you not think that we can have hopes of consolidating our holdings?—I have no hopes at all.

22390. In the course of your evidence you have told us that the non-official chairmen of District Boards have not acquitted themselves as creditably as they should have done?—I am talking only of those whom I know. I really meant the system.

22391. You condemn the system of having non-official Chairman?—Not the system itself so much as the personnel.

22392. Even if we take your statement to be true to some extent that some of these Chairmen have to live at times away from their headquarters, have not they got equally competent Vice-Chairman always living on the spot to look to the office and other necessary work of the District Board every day?—The results do not justify us in thinking that that is so. In one district I have known that the Chairman toured only for one day in the whole year.

22393. Perhaps the Vice-Chairman was touring?—The Vice-Chairman's tour does not carry the same weight.

22394. Your experience is restricted to one or two examples only?—Yes, to the examples of the districts in which I have been.

22395. With regard to the deterioration of roads, is it not due to this fact more than to any thing else, that in the old days when the chairman used to be the

official they had perhaps a greater latitude in spending the money on roads than the present non-official chairmen have?—I do not know about the latitude but probably they had more inclination.

22396. If I tell you that they have now got only a certain percentage of their income, because the whole of the income of the public works cess is to be set apart for sanitation, water-supply and similar other objects; that only the income from roads has to be spent on roads; that their income remains the same and the number and the mileage of roads is increasing as also the price of labour, does it not mean that the roads are sure to deteriorate unless you have additional income in spite of the chairman having a very great inclination for improving the roads?—It may be so. But in that case they ought not to increase the number of roads but ought to repair those roads that exist.

22397. Your statement as to the want of attention on the part of the Chairman to roads is not very accurate perhaps?—I think it is very accurate. I am sorry to say so but that has been my experience.

22398. Is it not the custom that all communications from the District Board to the higher Government officers are sent through the District Magistrate and is it not a channel through which the District Magistrate has the means of keeping himself conversant with whatever goes on in the District Board?—Yes.

22399. And the Divisional Commissioner and other officers are always at liberty to go and inspect the District Board and its offices?—That is so, but any attempt to give even advice is sometimes considered as an interference.

22400. In spite of the supposition of some of the people in connection with the District Board that this is an interference, Government never admit this so called interference?—Government do very little interference. They ought to do more for the good of the people.

22401. When you say that these District Board wells are not being used by the people, you restrict your statement to Eastern Bengal only?—Generally.

22402. You do not extend it to Western Bengal?—I have not got much experience of Western Bengal districts although that is my home.

It is very unfortunate for Western Bengal that although your home is there you have not given your attention to it.

22403. *Sir Ganga Ram*: On page 328 of your note you say, "In comfort, below comfort, above want and in want." Will you define these in rupees? What do you call "in comfort?" I want the income in rupees. Can you give me that figure?—I have mentioned that in my report.

Then I will not trouble you with it.

22404. You have mentioned Rs. 54 as the income. Is it per head of the population or per family?—It is the annual income per head.

22405. Supposing a family consists, according to your figures, of six souls?—The family in my note is a family of five persons, two adults and three children.

22406. And the whole income of that family is 5 times Rs. 54?—Yes.

22407. Supposing Government took upon themselves to do the irrigation. I understand in Bengal irrigation is not required except when the monsoon fails, is that right?—Yes.

22408. Supposing Government incur a large expenditure on irrigation works and the monsoon does not fail as is often the case, then Government lose the interest on the money?—The monsoon very often fails in Western Bengal. But it is not necessary that Government should undertake large irrigation measures.

22409. Unless you do that, it will never pay?—That is for the experts to say But my own idea is that we should take advantage of the existing sources first and then try to have large measures.

22410. *Sir Thomas Middleton*: On page 319 of your note you refer to the fact that the District Agricultural Officers require more freedom of action. From what does want of freedom of action arise?—I do not know but I have not seen them exercising any freedom of action.

22411. Freedom of action may be hampered by want of funds?—Yes.

22412. Do you not think the real reason is the financial one?—That is certainly the most important.

22413. You say on page 320 you would not care to see teachers drawn from the agricultural classes, because that would encourage them to give up agriculture and become teachers; but is the position not this, that the soil of Bengal is trying to support too many people?—I do not think so, because even in Jessore I found that where the pressure of the population was about 550 to the square mile it was a surplus district so far as food crops were concerned.

22414. You have indicated to us the very poor condition of the *bhadralog* in Jessore many of whom are landowners. Do you not think teachers could be found from the families of these men?—They are not agriculturists.

22415. You do not call landowners agriculturists in this Province?—No, not in Bengal. They are in water-tight compartments.

22416. You are thinking exclusively of the cultivators?—Yes. By landowners we mean rent receivers.

22417. You suggest the service is perhaps too top-heavy. Would you not agree that in the initial stages all Agricultural Departments must be top-heavy?—I have qualified that statement already in my oral evidence.

22418. You agree it is a temporary condition?—Yes; I have said it is not top-heavy if the subordinate staff is increased in the way it ought to be.

22419. You rightly, I think, attach great importance to the subordinate staff. How would you recruit that subordinate staff?—I do not know how they are recruited at present.

22420. How would you like to do it?—I have suggested having a school or a college here.

22421. Would you try to get them from among the *bhadralog*?—From any body who will come to this school.

22422. You consider suitable candidates might be found among such landowning classes as you have described in your Jessore report?—Yes.

22423. How long a training would you give them?—My idea was that there should be a school or college in the Presidency and all our staff should be recruited from that school or college according to the nature of the appointment and higher appointments should be filled from post-graduate scholars as elsewhere.

22424. What kind of salary do you think would be required for these demonstrators at the beginning of their service?—The salary they get at present.

22425. Rs. 30?—That is enough to start with.

22426. You refer to the losses on the demonstration farms. Is it not the case that the demonstration farms also carry out experiments?—Perhaps they do. They say they do, but I do not know what sort of experiments they carry on.

22427. I happen to have examined the accounts of one farm, and I found the demonstrations were profitable but the experiments had involved a loss?—I have given the accounts of the Jessore farm in my report. My idea was that in order to stimulate agriculture and induce people to take to it we ought to have demonstration farms which should be worked at a profit, so that people might see that a profit could be made out of it.

Sir Thomas Middleton: I agree.

22428. *Mr. Gupta*: With regard to the want of sufficient co-operation between the Agricultural Department and the people, I take it your object is to draw attention to the desirability of increasing the present amount of co-operation, and not so much to criticise the actual work of the Agricultural Department?—Exactly.

22429. And with that object you would like to see the subordinate staff of the Agricultural Department increased?—That is exactly my view.

22430. Similarly, as regards the ryots themselves, they are not averse from taking advice from officers of the Agricultural Department and the Collectors when they get it, are they?—No; I have said that.

22431. You say they are rather backward and conservative?—They are conservative.

22432. As agriculturists are all the world over, there is nothing special about our agriculturists?—No.

22433. With regard to your observations on the economic condition of the people, I suppose they apply more or less to Jessore, where you have worked as Settlement Officer, and Midnapore?—I have no notes of Midnapore.

22434. But you will admit that whereas the condition in districts like Jessore is probably unsatisfactory, on the other hand in progressive districts the position is much more hopeful?—Yes, I have said that in my report.

22435. So you do not want to draw any general conclusion that the condition of the agriculturists as a whole is becoming worse every day? You do not want to make any general observation like that; do you?—In some districts it is. What I have said about Jessore applies to Nadia with equal force.

22436. Not to the whole of Nadia?—Except the Kushtia sub-division.

22437. It only applies to places where the health conditions, want of water and so on are unfavourable to prosperous agriculture?—Yes.

22438. With regard to what you say as to the change in the administration of District Boards since they had official Chairmen, I take it your object is to draw attention to the want of time of the Chairmen and therefore their inability to come as closely in touch with the people as is desirable?—Yes. I have explained that, being otherwise fully occupied, they cannot spare the time for this.

22439. Do you think if we had paid Secretaries who would do inspection work this disadvantage might be overcome to some extent?—To a great extent.

22440. If they were paid?—Yes.

22441. And if they had executive control and could do outdoor inspection work?—Yes.

22442. Would you favour a sort of Local Self-Government Service going up from the Secretary of a circle to the Secretaries of the more flourishing District Boards?—That would be very useful, because if the Circle Officers are appointed Secretaries and so on they will make very suitable officers on account of their experience of local matters.

22443. *The Chairman*: I think you told the Commission that you yourself had some experience of farming?—Very little.

22444. Did you make it pay?—It pays in this way, that the establishment pays for itself and does other work also. Otherwise it does not pay from the monetary point of view.

(The witness withdrew.)

Rai KUMUD NATH MULLICK Bahadur, Ranaghat, Bengal

Replies to the Questionnaire

QUESTION 1.—RESEARCH.—(*a*) (1) In my opinion, research work all over India should come under a central institution. More facilities should be given to research officers, and all research works should be backed by sound finance. According to circumstances, there should be one or more research stations in every Province directly linked with the central institution. The result of all research, Imperial or Provincial, should be published in English by the Central Research Institution and in all the provincial vernaculars in respective Provinces.

(*b*) Not known to me.

(*c*) The water requirement of various crops.

A survey of the subterranean water-supply with special reference to irrigation.

The study of various indigenous grass and other rank herbage for fodder purposes.

QUESTION 2.—AGRICULTURAL EDUCATION.—Generally speaking, the time is not yet ripe in Bengal when a large number of men will come forward to take advantage of education, offered by an agricultural school to whatever type it may belong, high or elementary. It is, however, necessary that there must be some institutions for the training of a type of men who might eventually be appointed either under the Government or under private farms or work as teachers if necessary; or go in for farming on their own account. Having at first created a type of men like that it may be possible to interest the mass in improved agriculture.

(*i*) Not at present.

(*ii*) Yes. One institution of the status of existing secondary school in each Deputy Director's circle (*viz.*, East, North and West).

(*iii*) Preferably yes, but there should not be any hard and fast rule.

(*iv*) No, because they did not get any backing from the Government. If the passed students of such institutions are given appointments under the Government or helped by the Government by grants of lands and agricultural loans under proper safeguard, a large number of middle-class men will certainly take advantage of such courses.

(*v*) Service or private farming.

(*vi*) Not always.

(*vii*) Not known to me.

(*viii*) (*a*) It does not appear to appeal to the mentality of our average boys. To me, it seems that it is partially due to the lack of good teachers.

(*b*) At present, there is no school plot anywhere in Bengal as far as I know. But the idea of both school farm and school plot seems to be good. Moreover a well managed school farm may possibly help a large number of students in getting education, the cost of which he can probably earn by working in farms in spare time.

(*ix*) Service.

(*x*) Agriculture in Bengal will only be attractive to middle-class youths if there is a reasonable chance of getting a livelihood out of it. I am of opinion that the system of establishing fully equipped agricultural colonies, all over the Province and giving facilities to agricultural students to settle there, will help it to a great extent.

(*xii*) By actual demonstration work on the spot by qualified members of the Agricultural Department and by delivering systematic lectures by fully equipped travelling teachers. Lantern lectures are often appreciated in rural areas.

(*xiii*) The administration must be in the hands of the Agricultural Department but finance be made by the Government and public bodies.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(*a*) Field demonstration followed by the supply of good and improved seeds.

(*b*) The effectiveness of field demonstration can be very much increased if the Government guarantee against any loss that the cultivator may incur by allowing his lands for demonstration purposes.

(*c*) The cultivators may be induced to adopt and act up to the advice of the experts, if the experts themselves advise and help the cultivators in a more lively way than is being done at present.

(*d*) No such striking instance can be cited either of success or of failure excepting the success of some of the improved varieties of jute and paddy in Bengal.

R. B. Kumud Nath Mullick.

QUESTION 4.—ADMINISTRATION.—(*a*) I have already said that there should be a more centralised relation between the India Government and the Provincial Government in so far as the research work is concerned. Administration, propaganda and agricultural education must be kept decentralised and entirely provincialised without any reference whatsoever to the India Government. The Government of India can, however, take up the crop statistics and relieve the Agriculture Department of that work.

(*b*) Yes. The Provinces will certainly be more benefited if the scientific staff of the Government of India is increased, provided however, they are in constant touch with each other and the public. At present the provincial public, as a whole, is not fully in touch with the activities of India.

(*c*) (*i*) Not fully, I expect that they should show more life and less of officialism and red-tapeism.

(*ii*) As regards railway and steamers, the services are not efficient from the agricultural standpoint. They should give more extended facilities at cheaper rates for the transport of seeds, manures, etc., and for carrying all agricultural commodities including cattle, poultry, etc., from the places of production to the places of consumption. Cold storage arrangements for milk, vegetable, fish, eggs, etc., should also be taken up by them.

(*iii*) Better roads connecting long distances will help agriculture to a great extent.

(*iv*) Very little benefit is being reaped by the rural people from this department; but arrangements may be made whereby short summaries of various meteorological observations can be daily published in rural areas, preferably in the post office premises. The significance of these observations must also be explained. Unless some sort of arrangement be made to publish these things in local vernaculars, nothing would be done.

QUESTION 5.—FINANCE.—(*a*) Timely loan to help agricultural operations is of great importance to cultivators.

(*b*) The Government money that is ordinarily available for this purpose is a very insignificant sum in comparison with the vastness of the country.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(*a*) (*i*) The main causes of borrowing are for cultivation purposes as well as for meeting various social obligations.

(*ii*) Almost invariably the village *mahajan* (creditor).

(*iii*) Reasons preventing the repayment are: (*a*) Excessive interest, (*b*) failure of crops either actual or on economic grounds, and (*c*) excessive personal expenditure primarily on luxuries.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—(*a*) No, because no such arrangement can be made permanent so long as the present system of inheritance and rural conditions prevail. Moreover, very little actual benefit will accrue even if a large number of plots are consolidated together. Any endeavour in this direction will create a tendency in the country for extinguishing the present proprietors and encouraging the conversion of agricultural plots to big farms, thus reducing the present proprietors possibly to a state of servitude.

(*c*) I do not believe in any such artificial check. So long as the land courts will exist, there will always be a tendency on the part of the people to take recourse to them, if they feel aggrieved. There would be no difficulty on the part of the lawyers to find out numerous ways of avoiding the law even if it is passed.

QUESTION 8.—IRRIGATION.—(*a*) In every district of Western Bengal, there is need for the extension of irrigation schemes. I believe that a great deal more prosperity can be given to the ryot by organising irrigation schemes than by any other means of improved agriculture.

(*i*), (*ii*) and (*iii*) All of them are desirable wherever practicable. The main obstacle is the lack of funds.

QUESTION 9.—SOILS.—(*a*) (*i*) It is mainly for an individual to decide what to do. No generalised suggestion can be made regarding a Province.

(*b*) Not known to me.

(*c*) Reclamation and cultivation on favourable terms.

QUESTION 10.—FERTILISERS.—(*a*) In my opinion, the soil of Bengal requires much more organic matter than is at present existent in it. The amount of cowdung that is available is not sufficient to meet the demand. In the first instance, the quantity and quality of the cowdung should be improved by rearing more cattle and conserving the cowdung better and also by the cultivation of green

manuring crops and the utilisation of various waste substances, water weeds, etc. (if possible).

(*b*) The artificial fertilisers are not used in Bengal to any such extent as to justify the considerations in this respect.

(*c*) Under the present economic, climatic and soil condition of the country, I would advocate a more extended use of organic manure supplemented only by such concentrated fertilisers as may from time to time be found to be suitable.

(*d*) Nowhere in Bengal.

(*e*) No. Experiments conducted by the Government Department of Agriculture do not show any conclusive result. On the whole, however, the application of nitrogen seems to enhance a crop in most cases.

(*f*) It is very difficult to stop the practice, as the cultivators find it more profitable to use it as fuel.

QUESTION 11.—CROPS.—(*a*) (*i*) Something has been done in Bengal in this direction mainly by selection. The possibilities of hybridizing different varieties however do not appear to have been tapped.

(*ii*) This is desirable by all means that varieties of crops that have been found to be successful in other countries should also be given trial in Bengal.

(*iii*) It has been definitely found in Bengal that improved seeds give better results and it is only a question of organising a better seed supply. Encouragement should be given to reliable private parties to multiply seed from stock received from the Government and the Government should guarantee a minimum price for these seeds or subsidise the industry at initial stages.

(*iv*) Granting of more gun licenses to reliable parties.

(*b*) No. None of the present crops should be replaced though this suggestion does not apply to different varieties of the same crop.

QUESTION 12.—CULTIVATION.—(*i*) The indigenous methods should be improved on the spot. Bengal tillage will never be improved with foreign implements which are generally too heavy and ordinarily constructed without much reference to local conditions.

(*ii*) The present systems are the products of centuries of local experience and investigation.

QUESTION 14.—IMPLEMENTS.—(*a*) To me it seems that no machinery imported from foreign countries, will be of much use in Bengal, where the cattle are very weak and the land, very much divided. It has also not been definitely proved in Bengal that deeper cultivation is more profitable than shallow cultivation excepting in the money crops like sugarcane, potato, etc. Irrigation appliances are, however, very necessary and useful.

(*b*) If there is a demand anywhere, the organisation of co-operative societies is the only possible solution. The granting of loans by the Government to purchase these machineries may also be of help in isolated cases.

(*c*) Not known to me.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(*a*) In my opinion, it ranges between 150 to 180 actual days and for another period of 60 to 90 days the cultivator is actually confined to bed on account of malaria and other diseases. The rest of the days he generally devotes himself to his household duties, repairing of houses, looking after cattle, marketing of his produce, fishing and in some cases, working as day labourers.

(*b*) In these days of keen and strong competition with bigger interest, it appears doubtful whether any of the industries that at one time formed as the backbone of rural India, can ever be revived.

(*c*) These subsidiary industries are almost found in rural areas; according to their local suitability these things, however, exist as modest home industries. Any endeavour to reorganise them in bigger lines may probably ruin them altogether.

(*d*) Government have done practically nothing in this direction and the question of doing more does not arise at all.

(*e*) I am definitely against the industrialism of rural areas because the amount of gain that may be expected by the rural people will be more than counteracted by the introduction of all the vices that are incidental to such industrial concerns. It is also my experience that the majority of these workmen are imported from outside, the local people not always caring for such employment.

(*f*) Yes. Industrial tools and appliances have been proved to be much better than agricultural implements and as such, my answer to the question is in affirmative.

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(*g*) Rural prosperity will very much increase if the local agriculture be improved in all its branches and more facilities for transport and marketing be given.

(*h*) The question is so very important and vital to the very existence of the people that it cannot be relegated to the spare time of individuals and should be tackled by the Government, of course, with the help of the local people.

QUESTION 18.—AGRICULTURAL LABOUR.—(*b*) Really speaking, there is no shortage of agricultural labour in the Province as a whole, but in isolated areas, there is often a temporary shortage on account of migration. Some of the people who used to be labourers before have in some cases become petty-proprietors themselves. The prevalence of malaria has, in certain areas, restricted the supply of local labour.

QUESTION 20.—MARKETING.—(*a*) No. On account of the presence of numerous middlemen and various ways of adulterating the product, none of the crop market is safe from undue disturbance.

(*d*) The ordinary cultivator will not like much interest in the matter; he is generally guided by local considerations only. He is handicapped by the burden of his debt and generally the lien which his creditor has on the crop. Good market and crop statistics may however help the middlemen, but the present statistics as published in Bengal, are far from being accurate. Crop statistics or market information must either be made accurate or stopped altogether. An inaccurate estimate only serves to make the matter worse.

QUESTION 22.—CO-OPERATION.—(*a*) (*i*) and (*ii*) By the establishment of more societies. At present, however, the co-operative societies are more or less loan societies to members, and its various productive capabilities are either unknown or undeveloped. Co-operative productions and distributions should have a scope in the Government and non-official agencies.

(*b*) (*i-ix*) All of them are more or less necessary according to local circumstances.

(*c*) The very idea of legislation is antagonistic to the principle of co-operation. In such a case, instead of compelling the reluctant party to join in society, it is much better for the Government to intervene and get rid of the same by giving him compensation. Allowing them to continue to remain there, under protest, will create further troubles at every step.

QUESTION 23.—GENERAL EDUCATION.—(*a*) If some reasonable facilities can be given at any of the stages of general education, either by opening of school farms or school plots, there can be no objection, but no endeavour should be made to make agriculture a compulsory subject in any of these stages.

(*b*) It is a subject which has not been properly studied but which undoubtedly deserves more scrutiny.

QUESTION 24.—ATTRACTING CAPITAL.—(*a*) The activities of Bengal agricultural department have not yet convinced the public that agriculture is paying. As soon as it is proved, capital will come of their own accord, if they find it remunerative.

(*b*) The question is more of a financial nature, and the prospects in some cases are doubtful.

QUESTION 26.—STATISTICS.—(*a*) (*i-ii*) The improvement of agricultural statistics is very desirable but at present it is not being done thoroughly.

(*b*) Foreign demands of raw production such as jute, etc., may be published if possible.

Oral Evidence

22445. *The Chairman* : Rai Bahadur Mullick, you have been good enough to put before the Commission a note of your evidence. Do you wish to make any general statement now, or can we proceed at once to question and answer?—I do not wish to make any general statement.

22446. On page 349 of your note you suggest that passed students of agricultural institutions, if they are not given appointments under Government, might be encouraged by grants of lands and agricultural loans under proper safeguards. What lands have you in mind?—The *khas* lands that Government have.

22447. Have Government lands at their disposal at this moment?—Yes, in every district.

22448. Cultivable, unoccupied lands?—Yes.

22449. Lands of such quality as in fact to encourage cultivators?—Yes; in many cases they are good.

22450. *Dr. Hyder* : Are there any unoccupied Crown lands except in the Sunderbans?—In every district there are lands now lying fallow.

22451. *The Raja of Parlakimedi* : Cultivable waste?—Yes, a portion of them.

22452. *The Chairman* : On page 350 you say in answer to Question 5 on Finance, "The Government money that is ordinarily available for this purpose is a very insignificant sum in comparison with the vastness of the country." Have you any constructive suggestions to remedy that situation?—Yes, to give a proper allotment to agriculture. At present it is very much out of proportion that a vast country producing an income of 13 crores as revenue should devote only about 3 lakhs to agriculture.

22453. You think agriculture ought to get a larger share of the revenue?—Yes.

22454. On the same page you refer to irrigation. Have you noticed any demand on the part of the rural population for an extension of irrigation schemes?—Yes. They cannot do very well in agriculture unless they get good irrigation.

22455. That is your opinion, but is there any local demand for it on the part of the rural population?—Yes, of late there is.

22456. You think the need for further irrigation is appreciated by the cultivators?—Yes.

22457. I am struck by a passage of yours on page 351, where you are dealing with agricultural industries. You say the cultivator is actually confined to bed on account of malaria and other diseases for a period of from 60 to 90 days in the year?—Yes.

22458. On what observations or calculations may that statement be founded?—I myself see it on my own farm and on those all round me. They are actually lying down for between 60 and 90 days a year. There is no escape from malaria and other diseases.

22459. It is a certainty year by year that these recurring attacks appear?—Yes.

22460. Given sufficient quinine, could the situation be improved?—Yes, and in some cases it has been; but there are complicated diseases which do not succumb to quinine.

22461. You think that 60 to 90 days a year is a reliable estimate of the period during which the average cultivator in ordinary health is prevented by diseases from attending to his work?—Yes.

22462. Talking of subsidiary industries (or spare-time occupations, as you prefer to call them) you say that in these days of keen competition with bigger interests it appears doubtful whether any of the industries which at one time formed the backbone of rural India can ever be revived. You would probably wish to limit that statement of your view to such industries as are concerned with producing goods for sale; you do not include, I take it those spare-time occupations which enable the cultivators to provide themselves and their families with certain of their requirements?—They can certainly have those industries amongst themselves, but what I meant by my statement was that things which can be done by machinery could not be undertaken as home industries.

22463. But even though the cultivator may not get full value for his time in terms of industrial wage payment, the fact is that, since the cultivator is necessarily

unemployed during such a long period in the year, it pays him to make as many of the requirements of his home as possible with his own hand?—Certainly.

22464. I take it, as you agree to that, you would not object to any attempt to popularise the use of modest implements by any means that might be at the disposal of Government?—No.

22465. You say, "Any endeavour to reorganise them (home industries) on bigger lines may probably ruin them altogether." What are you thinking of there?—I have seen that wherever any attempt is made to make industries pay by introducing machinery the home industries generally become scarce.

22466. Is it a question of making them too expensive?—Yes; they generally forget how to do it by hand, and they adopt the machines which are less troublesome to them.

22467. On page 352 you say, "there is often a temporary shortage of labour on account of migration." What migration are you thinking of there?—Migration within the district.

22468. On the same page, in answer to Question 22, you express the view which the Commissioners have heard from other witnesses, that rather than compel a minority to conform to any scheme of improvement in the community, Government should intervene and give the members of the community consisting of such a minority compensation?—Yes.

22469. Do you not think that a scheme of that sort might raise the number of objectors?—Not generally. If it is made a paying business, you will find a good many people quite prepared to engage in it.

22470. *Sir Henry Lawrence*: As regards those industries which you wish the ryot to take up, would you include spinning of yarn?—Yes.

22471. Has that taken root at all in your district?—No.

22472. Is there any *khaddar* propaganda there?—Not very much.

22473. Do you attach much value to that propaganda?—We have very little knowledge of that propaganda in our district, because we have already the weaving industry in our district.

22474. All the more reason to find that a fruitful soil; has that been extended?—Not extended, because it is all done with foreign yarn.

22475. Your weaving is done with foreign yarn?—Yes.

22476. Could it not be done with yarn spun locally?—They do not know how to spin fine yarn.

22477. At one time they used to do it?—Yes.

22478. How long ago did it die out?—Long before the British came here.

22479. One hundred and fifty years ago?—Yes.

22480. That is not the view of history; it is popular belief?—It is true; I have myself written a history of our district.

22481. You have written a history and investigated this point?—Yes.

22482. That will be an interesting document; could you let us have a copy?—Yes.

22483. You remark that malaria incapacitates people for 90 days in a year; is that limited to the district of Nadia?—Nadia and Jessore specially, and speaking generally.

22484. It applies to other districts in Bengal?—Yes.

22485. As to migration, to what part of Bengal do your people migrate?—I have stated that they migrate within the district.

22486. Within the limits of the district from one place to another?—Yes.

22487. Is that a point to which you object?—No, because by their doing so everybody gets labour.

22488. It is a beneficial thing; you do not deprecate it?—No; I do not.

22489. Do your labourers emigrate overseas at all?—No; not to my knowledge.

22490. Do they emigrate to Assam?—Not to my knowledge.

22491. This migration is only a seasonal movement within the district for the benefit of agriculture?—Yes.

22492. Can it be encouraged?—There are two sides of the question. Migration from a place where there is not enough labour already is bad; but migration from a place where there is surplus labour is good.

22493. In any case this migration is of some benefit to the labourer who migrates?—Yes.

22494. *Sir Ganga Ram*: Would the poor people of Bengal emigrate to other Provinces if good land were given to them?—Perhaps not.

22495. They are too home-ridden?—Yes. The labouring class would not, but the middle-class would.

22496. For clerical service?—Also for land and other things.

22497. They would not touch the plough?—But they will go in for big farming on scientific lines.

22498. What do they know of farming?—There is a section of the population who know it.

22499. Have they capital or do they expect Government to supply them?—They have a modest amount of capital but they want Government to help them.

22500. Has the introduction of the Reforms in any way ameliorated the condition of the poor people?—It is practically not known to the poor cultivators.

22501. Has it benefited them in any way or not?—I am not competent to say.

22502. Are you a member of the Legislative Council?—No.

22503. *The Raja of Parlakimedi*: Does the Bengal Tenancy Act provide enough security for the ryot to induce him to take an interest in his own holding and carry out improvements?—Yes; whatever might be the law, by custom they have a permanent tenure of the land.

22504. The occupancy right of the cultivator is safeguarded?—Yes. As soon as a permanent tenant of a village touches land it becomes his, and the zamindar has no right to take it from him. Practically the tenants are the masters.

22505. The same thing prevails in Madras too. After exchange of *pattas*, if a tenant lives for a period of twelve years in a village, the tenancy law gives him right to any land he touches. So, the zamindar has no inducement to purchase that kind of land, unless it be that he wishes to keep the land under his own private cultivation?—Yes.

22506. As soon as he allows the ryot to enter upon that land and cultivate, the right of occupancy goes to the ryot?—Yes.

22507. So, the zamindar while lending money to the ryot, does not entertain the hope of acquiring the ryot's land?—Certainly not.

22508. *Professor Gangulee*: Are you a member of the Provincial Board of Agriculture?—Yes.

22509. Can you tell us how that Board is working in Bengal?—Its activity is *nil*.

22510. Could you account for that?—It has been introduced only recently, and it has yet to be organised in a proper way. Perhaps that is the reason why it does not work properly.

22511. *Sir Henry Lawrence*: How many years ago was it formed?—Some six years ago.

22512. Has it been working for six years?—I do not know exactly.

22513. *Professor Gangulee*: Could you account for this state of affairs? Six years may be considered to be quite a long time, is it not?—Recently they have taken in other members, they have resolved to have quarterly meetings, and so on, and they are showing some activity.

22514. What are the activities?—Nothing particular, but they have resolved to meet quarterly; recently, they have framed rules to guide them properly.

22515. Have you, as a member of the Board of Agriculture, submitted any proposal to infuse life into this organisation?—No.

22516. What quantity of jute seed do you grow on behalf of the Department of Agriculture?—I have often supplied seed worth Rs. 3,000 to Rs. 4,000.

22517. What variety do you grow?—*Chinsura green* and *C. Capsularis*.

22518. You grow it from year to year?—Yes.

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22519. Do you find any change in the quality of seed, or any deterioration?—No.

22520. Have you any practical experience in that direction? Have you tested the seed grown from year to year to see whether there is any deterioration in the quality, and to see whether it is maintaining its strength and purity?—Yes, but on this question I may be permitted to say that the supply which comes from the Agricultural Department is always good, but if it comes through any middlemen then there is mixing of other inferior varieties, and many complaints have been received against these seeds.

22521. Have you any co-operative organisation?—Yes.

22522. Are you in touch with it?—Recently I have not been in touch with it.

22523. Why did you sever your connection with it?—I fell ill and went away from home.

22524. You still retain your interest in the movement?—Yes.

22525. Do you closely follow this movement?—Yes, in a general way, not entirely.

22526. Do you realise that the co-operative movement may offer very substantial help to the cultivator?—Certainly, if it is conducted properly.

22527. What do you mean by 'conducted properly'?—If officers do their duty faithfully.

22528. Do you mean to insinuate that they do not?—No, they do their duty.

22529. And, though you realise the importance of the co-operative movement, you are not yourself taking any interest in it at the present moment?—I was taking interest in it; for six or eight years I was Director of two associations there.

22530. Just now are you taking any interest?—No, but I am a member still.

22531. Member of what?—Member of the co-operative society.

22532. Is it an urban bank?—Yes.

22533. Are you in touch with any rural co-operative society?—No.

22534. Are you in touch with any sale society?—I have heard that there are only a few of these sale societies but practically ordinary societies are now loan societies.

22535. Do you attend any of the Provincial Co-operative Conferences?—Yes.

22536. You are invited there?—Yes.

22537. What experience have you of agricultural education? Have you started any school yourself, or are you in touch with any school in your district?—There are some schools which I know.

22538. Have you been to the Chinsura Agricultural School?—Yes.

22539. What are your views with regard to the success of agricultural education in vernacular schools?—It is quite possible.

22540. Can you tell this Commission your views as regards the failure of the Chinsura experiment?—It is due to the apathy of the general public to take up agricultural education.

22541. That is the main cause of failure?—Yes.

22542. Have you any suggestion as to how the interest of the public could be roused?—As soon as agriculture appears to them profitable, the demand for schools will grow.

22543. Not till then?—Not till then.

22544. You attach more importance to demonstration farms?—Yes.

22545. Do you participate in any demonstration work yourself?—Yes.

22546. Who demonstrates in your district?—It is generally done by ourselves.

22547. Does the Department of Agriculture help you?—Yes, they help us.

22548. What sort of help do you derive from the department?—We get the best seeds from them, and sometimes they give us instructions which we follow.

22549. Can you kindly describe a field demonstration to us, that is, how things are done at present?—To my knowledge, it is not done anywhere by the department in the proper sense of the word, but individually somebody does it; of course their staff too is very limited.

22550. What is the nearest demonstration farm you have?—We have no demonstration farm anywhere near us; at Dacca there is one.

22551. There is no demonstration farm nearer to Ranaghat than that?—No.

22552. Is any demonstration on private farms carried on by the Department of Agriculture?—With the help of the Agricultural Department we do it.

22553. I want to get from you your relationship with the Department of Agriculture. What is your relationship with them as a practical farmer?—Whenever I ask for their help they help me with their advice; that much and nothing else.

22554. Do they assist you in your propaganda work, if you do any?—Not much.

22555. *The Raja of Parlakimedi*: Do they spare any demonstrators?—No; except sending me seeds and giving me advice when I ask for it, they do nothing else.

22556. They do not send any trained demonstrators?—No.

22557. *Professor Gangulee*: Are you in touch with the cultivators in your neighbourhood?—Yes.

22558. Do they come to you and do you go to them?—Yes.

22559. What sort of views do you exchange with each other? What do they ask of you and what do you ask of them?—They are benefited by the successful demonstrations that we carry on in our fields, they watch our proceedings keenly and they question us about them; they adopt any methods which are not expensive.

22560. *The Raja of Parlakimedi*: Have you applied to the Agricultural Department for demonstrators?—No; I have my son who is trained in agriculture, and therefore we have some facilities for carrying on our work.

22561. *Professor Gangulee*: You have had some success in the demonstration work in your own private farm?—Yes.

22562. Is it better seed, better manure, or better implements?—It includes everything; I use tractors and up-to-date machinery.

22563. Is it a Fordson tractor?—No; it is a bigger one of 20 horse-power, manufactured by the International Harvester Company.

22564. *Mr. Calvert*: Is that under the advice of the Agricultural Department?—No; we do it ourselves.

22565. *Rai Bahadur Bannerji*: Did not the Agricultural Department advise you to do it?—No: we did it ourselves.

22566. *Professor Gangulee*: In these demonstrations, what commends itself most to the cultivators' point of view; is it better seed, better manure, or better implements?—They are struck by the general results of all combined, but particularly seed.

22567. Do they look about for better seed?—No; of course I give it to the local people and they do it; for miles around my farm they are growing my seeds.

22568. You mostly grow jute and paddy?—Mostly jute and paddy, but now I am taking up sugarcane, and I am going to give up jute and paddy, because it does not pay enough.

22569. Not even jute?—Not even jute.

22570. So, you are proposing to give up jute and paddy and to replace those crops with sugarcane?—Yes, and that is done under the instructions of the Director of Agriculture.

22571. You have already started it?—Yes.

22572. What variety of sugarcane do you cultivate?—Co. 213, the Coimbatore variety; that gives very good results.

22573. Have you already had experience of it?—Yes.

22574. And the yield is satisfactory?—It is very satisfactory.

22575. *The Raja of Parlakimedi*: Have you got any of the Java varieties or the Mauritius varieties?—Yes.

22576. *Sir Henry Lawrence*: What rotation are you going to adopt?—Potatoes and some land with jute.

22577. Your rotation will be sugarcane, potatoes and jute?—Yes.

22578. And that was advised to you by the Director of Agriculture?—I do not remember the particular rotation which he recommended to me, but he recommended me, if jute and paddy did not pay, to grow other crops, and he recommended the growing of sugarcane, potato and jute also.

22579. *Sir Ganga Ram*: Do you grow any cereals?—Cereals are taken as a second crop on the land when paddy and jute are taken out. On my farm, at present it is done in that way, but I am going to change it; I am not going to grow any cereals.

22580. Not even millets?—Not even millets.

22581. How big is your farm?—My experimental farm is about 200 *bighas* and my demonstration farm is something like 600 *bighas*. When I bought the big tractor, I had in mind to go in for big farming, but, as I said, it does not pay to go in for big farming if you grow paddy and jute; I therefore thought that I should take up something else which will pay me more. Then, the question of irrigation has everything to do with the success of these crops. When I went to take this up on a big scale, there was some water on the plot, but I do not know the reason why now the moisture from the soil is disappearing, so to say. Every year it is seen that the moisture goes down and down. The rainfall in that area is 60 inches, but whatever quantity may fall on one day, if it stops for three or four days you will find the moisture gone from the surface of the land.

22582. *The Raja of Parlakimedi*: Is there no scope for having a tank?—The land is so porous that tanks are not very useful.

22583. *Sir Ganga Ram*: Have you ever had a section of the soil taken?—Yes.

22584. What does it consist of?—It is sandy loam.

22585. What is it down below?—Down below it is pure sand.

22586. Up to what depth?—We have just now a tube well, and we found that as far down as we could go it is sand.

22587. Well irrigation does not pay there?—It does not pay, but recently we have had a tube well of 3½ inches diameter, which is working with a power pump; it is doing very well, and we have great hopes of it. We did it purposely shallow to see whether it is possible for us to get water at less expense, and I am glad to say that it has proved very successful.

22588. How far did you go down?—About 60 feet.

22589. Did you put a strainer below?—Yes.

22590. Whose strainer was it?—We made it ourselves.

22591. Did you ask any professional man about it?—My son has learnt something about the sinking of tube wells and he has done the whole thing himself.

22592. *The Raja of Parlakimedi*: How many acres of sugarcane have you got at present?—Twelve acres.

22593. And you are managing with the help of this well to irrigate that crop?—Not all, only a portion of it, because it has been sunk only last year, and it has not yet been properly tried. The supply of water for vegetables and other crops this year has been enough; it gives 3,000 gallons an hour, and I think after a year's use it will be able to give more.

22594. *Sir Ganga Ram*: Do you pump the water with an oil-engine?—Yes.

22595. *The Raja of Parlakimedi*: How do you water the rest of your sugarcane crop?—We do not water it; we mulch the land with our tractor, and we preserve the moisture as much as we can, and that helps us.

22596. It has to be irrigated periodically?—We do it without irrigation; irrigation means money which we cannot spend; naturally the return is less; we spend a little and we gain a little.

22597. Is the growth quite all right?—In some cases it is.

22598. *Sir Ganga Ram*: What is the cost of working your tube well?—I shall have to work out the figures.

22599. How much is it per acre?—It gives 3,000 gallons per hour. If I work my pump for eight hours it gives enough water for one *bigha* of potato crop. It costs only 6 annas per hour.

22600. What is the yield of potatoes in this Presidency?—It is 60 to 80 maunds per *bigha*.

22601. Do you put any fertilisers on it?—Yes, we put on castor cake and a little manure. The more enlightened class are now using sulphate of ammonia and also chilean nitrate.

22602. *Professor Gangulee*: You have 200 *bighas* of experimental plots and 600 *bighas* of demonstration farm. What is the difference between the two?—As I have just now told you, I had in my mind the expansion of my agricultural operations. So whatever crop proves successful in my experiment, I shall have it on a bigger scale afterwards.

22603. So you do not carry out experiments of various crops in the proper sense of the word?—At first I used to do that but now I have actually taken up sugarcane as my chief crop.

22604. Do you depend on the profits of these farms or you have other sources of income also?—I have other sources also.

22605. Is any one else in the neighbourhood going in for sugar cultivation?—Not to my knowledge.

22606. You have now got 12 acres of sugarcane. May I know what is the outturn from these 12 acres?—It must be not less than 20 maunds a *bigha* of *gur;* that is without irrigation.

22607. That is more profitable than jute or paddy?—Certainly.

22608. Do you give this information that sugarcane is more profitable than jute or paddy to the cultivators in the neighbourhood?—Yes.

22609. And what is the effect of the information? Do they take to sugarcane cultivation?—Some persons have taken to it.

22610. What are the handicaps to the extension of sugarcane in your district?—In my district there are large plots where sugarcane cultivation has gone down because the crushing of the sugarcane is a thing which requires animal-power as well as man-power. So, during the months when malaria is raging seriously in the district they cannot take it up in right earnest and the cattle too are very weak. After doing this sugarcane work, they cannot take up the new crop work which is to be taken up at once. There is also the loss of facilities.

22611. *Sir Ganga Ram*: Do you grow cotton?—No. I grow cotton only for my own use.

22612. Is the land not suited for growing cotton?—Not much; we have tried it.

22613. *Professor Gangulee*: Who manages your farm? Do you manage it yourself or is it managed by your son?—It is managed by my brother and by my son.

22614. Do you keep your farm accounts in minute detail?—Yes.

22615. Taking into consideration the labour employed per crop per unit of area?—Yes, everything.

22616. Now, please turn to page 350 on agricultural indebtedness. You are in touch with the agriculturists?—I am.

22617. Do you go to their houses and attend their social functions and so on?—Yes.

22618. You say that various social obligations are one of the causes of borrowings?—Yes.

22619. And you also mention "excessive personal expenditure, primarily on luxuries." Do I understand then that the standard of living is increasing in your district?—Decidedly. But it is increasing at the expense of the money which costs them their blood.

22620. Do you not think that it is a hopeful sign that the standard of living is increasing?—Certainly not, because they do it all by borrowing. They come in contact with gentlefolk and come to know that a wrapper can be had for Rs. 2 and a hurricane lantern for one rupee and they never deny themselves these things. They at once buy them.

22621. Do you mean to suggest that the rise in the standard of living is so artificial that the whole thing depends on borrowing and not on the additional income?—Unfortunately that is so.

22621*a*. Have you made any definite inquiries as to these facts?—I see it every day.

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22622. With regard to fragmentation of holdings on page 350 you say that "very little actual benefit will accrue even if a large number of plots are consolidated together." Do I understand that you are against consolidation of holdings?—Yes.

22623. Would you state as briefly as possible your reasons for holding that view?—I have given my reasons in my statement. It says, "Any endeavour in this direction will create a tendency in the country for extinguishing the peasant proprietors and encouraging the conversion of agricultural plots to big farms, thus reducing the peasant proprietors possibly to a state of servitude."

22624. I do not understand what you mean?—The labouring class will have to withdraw themselves from the land and they will have nothing to fall back upon during their bad times. And if this is done, they will be turned into landless labourers.

22625. You are probably confusing the terms sub-division and fragmentation?—You can put it as you like.

22626. I want to know whether you have gone into the question of fragmentation carefully. Do you know the experiments done in the Punjab or in any other part of the country?—I have only given my general opinion.

22627. *The Raja of Parlakimedi*: As regards *gur*, may I know what your net cash income will be per acre?—It will be something like Rs. 480 per acre.

22628. Is that gross income?—Yes.

22629. *Sir Ganga Ram*: Is that without fertilisers?—We use a little cow-dung manure for top dressing only.

22630. *The Raja of Parlakimedi*: What does paddy fetch you per acre?—I have a statement here about the cultivation cost of jute and paddy.

22631. You have not got a comparative statement of sugarcane?—No. I have two crops of paddy, *aus* and *aman*. The *aman* is a very uncertain crop in Bengal as it depends very much on the rains. It generally fails if we do not get any rains when it is ripening. But the *aus* crop, although it is very costly, is a certain crop. We can say definitely that we can get something at least out of it.

22632. You have not got a comparative statement between sugar and paddy?—No, I have not got it here, but I can tell you roughly.

22633. Can you let us have it later on?—I will do that (*vide* Appendix).

22634. *Mr. Calvert*: To come back to Professor Gangulee's question about fragmentation and your objection to consolidation. I should like to read you the remark made by a certain landlord and should like to ask you how far it reflects your opinion. It reads as follows:

"Every farm swarms with little holders; they are too poor to improve their land, and yet it is impossible to turn them out as they have no other means of subsistence." Was that your point about starvation?—Yes.

22635. That was remarked by Lord Palmerston many years ago with regard to Irish estates. With regard to indebtedness, is any pressure brought to bear for the repayment of the principal so long as the interest is paid?—Yes, when the crop fails for consecutive years.

22636. He does press for repayment?—Yes.

22637. *Mr. Gupta*: You are a practical agriculturist?—Yes.

22638. You have a farm of your own?—Yes.

22639. Is it a financial success? Do you make money out of it?—No, it was not a financial success, but now that I am putting in sugarcane and potatoes the position is changing.

22640. It is beginning to pay now?—Yes.

22641. Do you think agriculture offers a suitable opening for our young men?—Yes, it may. You mean with small capital and small holdings?

22642. Yes?—Unless it is done in an improved way, it does not. It does not as it is done at present.

22643. Do you not think it would be a very good thing if by actual demonstration it could be shown that small farms could be made to pay?—Yes; that is a very important matter.

22644. Would you be in favour of our having a small commercial farm near Calcutta which young men could go and see?—Nothing could be better.

22645. And would you be in favour of our introducing a little engineering education on that farm?—That is very necessary.

22646. You are in favour of that?—Yes. I could not have been as successful as I have been if I had not given my son a little education in engineering.

22647. *Sir Henry Lawrence*: Where was he educated?—At Naini College, and he also had some practical education under European engineers. I consider it very important that improved implements should be devised on the spot with the help of agricultural engineers with good qualifications from England. That is a point which I would ask the Commission to bear in mind.

22648. *Sir Thomas Middleton*: You have 800 *bighas* under cultivation?—No, I have only 200 to 300 this year. I bought the land to take up farming on an extensive scale, but I have since, after doing it for a year or two, changed my policy.

22649. What is the actual size of your holding at present?—About 300 *bighas*.

22650. How many pairs of bullocks do you keep for that?—I have now five pairs of bullocks and buffaloes combined, and one tractor.

22651. Can you tell us how many pairs of bullocks you save by using one tractor?—Yes. With 300 *bighas* it would require 25 pairs of bullocks. Unless the land is of that area or larger, the question of employing a tractor never arises.

22652. You refer to the fact that your cattle were very weak after the sugarcane season?—Yes.

22653. What fodder crops do you grow for cattle?—As a general rule fodder crops are not grown. Do you mean I myself?

22654. Yes?—I grew *juar* and Guinea grass. I have many things on which to feed my cattle.

22655. With the help of *juar* and Guinea grass, can you not keep your own cattle in good condition after the sugarcane season?—No. That is the season when these things do not keep well.

22656. You refer to the need for rearing cattle in order to get an abundant supply of manure?—Yes.

22657. Are you attempting to improve cattle yourself? Are you rearing cattle?—Yes.

22658. Do you attempt to improve them?—Yes. I have a Hissar bull, and its services are free to my neighbours.

22659. Is that bull of much larger size than the ordinary run of cattle in Bengal?—Yes.

22660. Do any difficulties arise?—Sometimes the calf is too big.

22661. How many cows do you keep yourself for milk and rearing calves?—I have some dozen milch cows of which some are dry and some in milk.

22662. The common practice is that when fodder is scarce the bullocks get it and the cows get none. Do you feed your cows as carefully as you feed your bullocks?—Yes.

22663. At what age do your calves become fit for work?—When about three years old.

22664. At what age do the young cattle of your neighbours become fit for work, the ordinary cultivators' cattle?—About that time. With regard to the fodder question, the important thing is the education of the public. It is possible to keep the fodder in good condition.

22665. By means of silos?—Yes. Everything depends on good demonstration.

22666. *Sir Ganga Ram*: Do you grow any winter turnips or carrots?—Yes, not for the cattle but for the market, for human consumption.

22667. You sell those?—Yes, and also potatoes; we grow every sort of seed at present, and vegetables especially.

22668. *Sir Thomas Middleton*: You have no difficulty in constructing silos in your soil?—No, but it is not done under the earth, but above ground. We have another principle of storage.

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22669. And you have not lost much of the fodder?—No; not much.

22670. *The Chairman*: You mean you store it in a tower?—Yes, in a big bamboo shed, with bamboos all round.

22671. *Sir Thomas Middleton*: Do you use much weight for pressing?—Only human pressure; some men are there to trample it.

22672. Do you put earth or stones on the top?—Yes.

(The witness withdrew.)

The Commission then proceeded to hear Dr. E. H. Pascoe for whose evidence please see Volume I, Part II.

After Dr. Pascoe's examination, the Commission adjourned till 10-30 *a.m. on Wednesday, the* 8*th December*, 1926.

APPENDIX

Comparative statement of the cultivation cost of crops

Jute for one bigha of land.

Preparatory tillage in—		
Cold weather	... ...	3 ploughs with ladder.
Manuring	... ...	16 cartloads of cowdung.
March and April	... ...	3 ploughs with ladder.
Sowing	... ...	1 plough with ladder.
Thinning cost	... ...	1 on the whole.
Weeding	... ...	18 men average.
Reaping and binding	... ...	5 men.
Carrying to water	... ...	3 carts and 2 men.
Steeping	... ...	2 men.
Retting	... ...	6 men.
Carrying to house	... ...	1 cart and 1 man.
Drying and poles, etc., for the same	...	1 man and 4 annas.
Storing	... ...	2 annas.
Rent of land (half calculated)	... ...	Re. 1 per *bigha*.
Cost of seed 1 seer per *bigha*	... ...	Re. 1.

N.B.—Yield—6 maunds per *bigha*.
Jute stick—8 annas.
Plough, at 12 annas each.
Man labour, at 8 annas each.
One cartload of cowdung—4 annas.
} Cost is calculated at these rates.
Average Rs. 30 cost.

Aman paddy for one bigha of land.

Preparatory tillage	... ...	4 ploughs with ladder.
Ploughing in puddle	... ...	1 plough.
Transplanting seedlings	... ...	2 men.
Proportion of cost for seed at nursery	...	2 annas.
Cost of 6 seers of seed at Rs. 3 per maund.		
Manure and application of the same—12 cartloads of cowdung 4 annas per cart	...	Rs. 3.
Work of shade	... ...	2 men.
Reaping	... ...	3 men.
Binding and carrying	... ...	3 men.
Threshing and winnowing	... ...	3 men.
Storing	... ...	1 man.
Rent	... ...	Rs. 1-8-0 per *bigha*.

Maximum yield.—Eight maunds per *bigha*. But it should be remembered that this crop depends much on rain and hence uncertain.

Straw.—One and half *kahans* at Rs. 5 per *kahan*.

Approximate cost—Rs. 15.

Aus paddy for one bigha of land.

Preparatory tillage in—		
Cold weather	... ...	3 ploughs with ladder.
Manuring	... ...	12 cartloads of cowdung.
March and April	... ...	4 ploughs.
Sowing	... ...	1 plough.
Thinning cost	... ...	1 man on the whole and 2 bullocks.
Weeding	... ...	18 men.
Harvesting	... ...	3 men.
Carrying	... ...	2 men and 2 carts.
Threshing with bullocks and winnowing and preparation of threshing land	... ...	2 men and 4 bulloks.
Storing	... ...	1 man.

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Rent of land (half calculated against *Aus* crop) ... ... Re. 1 per *bigha*.
Cost of seed (12 seers) at Rs. 3 per maund ... 14 annas 6 pies.

N.B.—Cost of ploughing at 12 annas each.
Man labour at 8 annas each.
One cartload of cowdung at 4 annas per cart.

Yield.—Six maunds per *bigha*.

Straw.—Rs. 2.

Cost of tractor ploughing—
Ploughing once ... ... Rs. 3-8-0 per *bigha*.
Discing twice ... ... Rs. 3-8-0 per *bigha*.

Approximate cost—Rs. 25.

Sugarcane per acre.

	Rs.
Preparatory tillage	20
Cost of setts	45
Cost of manure	24
Cost of labour for planting setts and covering the same ...	20
Cost for weeding, hoeing and earthing up	12
Cost of irrigation	25
Cost for harvesting cane	7
Cost of dressing and carrying the same to the mill	18
Cost of crushing and *gur* boiling	36
Rent per acre	6
Miscellaneous expenses such as fencing, tying and watching the crop, etc.	30

Average yield—600 maunds of cane or 60 maunds of *gur* per acre.

R. B. Kumud Nath Mullick.

Wednesday, December 8th, 1926

CALCUTTA

PRESENT :

The MARQUESS OF LINLITHGOW, D.L. (*Chairman*).

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S.
Sir THOMAS MIDDLETON, K.B.E., C.B.
Rai Bahadur Sir GANGA RAM, KT., C.I.E., M.V.O.
Sir JAMES MACKENNA, KT., C.I.E., I.C.S.
Mr. H. CALVERT, C.I.E., I.C.S.
Raja Sri KRISHNA CHANDRA GAJAPATI NARAYANA DEO of Parlakimedi.
Professor N. GANGULEE.
Dr. L. K. HYDER.
Mr. B. S. KAMAT.

Mr. J. N. GUPTA, I.C.S.
Rai A. C. BANNERJI Bahadur } (*Co-opted Members*).

Mr. J. A. MADAN, I.C.S.
Mr. F. W. H. SMITH } (*Joint Secretaries*).

Sir P. C. RAY, Kt., D.Sc., University College of Science and Technology, Calcutta

Replies to the Questionnaire

DETERIORATION OF THE CATTLE.—MILK INSUFFICIENCY.—In England and on the Continent, cattle-breeding and dairy-farming, poultry, etc., form an essential part of agriculture. I shall therefore confine myself only to this aspect. As not only milk insufficiency—but what I may call milk-starvation in the average diet of the Bengalee has led to malnutrition, stunted growth, rickets, etc.

During my tour in Europe, I had ample opportunity of seeing the extensive pasture lands alternating with arable lands in France, England, Ireland and Scotland. Not only in Ireland, called the Emerald Isle, but even in the other lands green verdure always greeted my eyes. I often found stately bulls and cows browsing and chewing the cud leisurely, the long grown grass cut down and exposed to the sun in order to be converted into hay. I was told that in many a plot as many as three crops of hay are yielded during these summer months.

During my six years' residence in Edinburgh (1882-1888) I often used to watch with interest in the extensive fields outside the town various kinds of food crops grown specially for the cattle, *e.g.*, turnip, carrot, mangel-wurzel. Macaulay writing of the state of England in 1685 says :—

> " The rotation of crops was very imperfectly understood. It was known indeed that some vegetables lately introduced into our island, particularly the turnips afforded excellent nutriment in winter to sheep and oxen : but it was not yet the practice to feed cattle in this manner. It was therefore by no means easy to keep them alive during the season when the grass is scanty. They were killed and salted in great numbers at the beginning of the cold weather." Again, " the sheep and ox of that time were diminutive when compared with the sheep and oxen which are now driven into our markets."

In my days of childhood, now close upon 60 years ago, almost every household in Bengal had its *goshala* (cow-shed) where milch cows were tended and taken care of. Straw was piled up for at least six to eight months' consumption. There was in every village a number of commons. According to the Hindu notion, the cow is an embodiment of the Goddess Bhagavati and every householder considered it a point of religion to feed the cow and look after her. The diet and regimen of the cow consisted of well chopped straw, soaked in water with an admixture of bran and oil-cake. Tender shoots of various plants, chopped plantain or bannana plants, gruel of the cooked rice also were given at intervals.

Now, alas, all this is changed. Very few householders even in the villages can boast of milch cows. The pressure on the land during the last half a century has been enormous and this is due to a variety of causes some of which may be enumerated here. Every village was in a manner a self-contained republic. It

had its community of weavers, blacksmiths, and carpenters specially for the construction of country boats for inland navigation. Manchester piecegoods have deprived the weavers, *jolas* and *tantis*, of their means of livelihood. Imported cutlery has also played havoc with the village smith. Sixty years ago again every navigable river in the lower Bengal was studded with country-boats of 500 to 1,500 maunds "tonnage," and these used to give employment to thousands of crews. Nowadays they however are now plod with the steamships of the B. I. S. N. Co. Of course a few lascars are employed in these but they do not come up to even 5 per cent. of the boatmen who used to find occupation in the days gone by. The result has been simply disastrous. All the artisans and the boatmen have had their morsels of bread thus snatched away from their mouths and they have been driven to land as the only source of their sustenance. It might be urged that there are some 82 jute mills on the banks of the Hooghly, but they give employment to, at best, 4 or 5 lakhs of people of which again barely 5 per cent. are Bengalis.

Owing to the extension of jute cultivation again, there has been encroachment on the village commons or pastures. There were also in many districts in Bengal extensive grants of land, by Raja Krishnachandra of Nadia, and Rani Bhowani of Natore, of pious memory, to *gowalas*. Unscrupulous zamindars or land-grabbers have taken possession of them after harassing litigation. Not far from Poradah is a railway station called *Gowal Bathan* or pasturage for cowherds. Such names only remind us of the state of things which once existed.

During the last five years in connection with the relief operations of the Khulna famine and the North Bengal flood, I have had to make extensive tours into the villages of these regions and study their economic condition. The cattle in some parts of Rajshahi, in the recent flood area, are diminutive in size, shrivelled in limbs, and reduced to skeletons. Mr. C. F. Andrews who visited the area wrote to the papers saying that to use such bullocks for ploughing purposes is cruelty to animals. The milch cows, lean and shrunken, barely yield on an average 2-3 lbs. of milk. On the contrary, London with a population of 7 millions, is provided with rich milk in abundant profusion before 7 o'clock in the morning. There are also throughout London, scattered at intervals, any number of dairies, containing rich supply of milk, cream, butter, eggs, etc. Throughout Bengal with the exception of one or two districts milk is procurable at only 6 annas per seer and that only in limited quantity. Those who are fairly well off have to depend upon condensed Swiss milk, Horlick's and so on, but very few can afford such luxury. For infants during their period of growth milk is the most ideal food—in fact it contains all the constituents necessary for the growth of the bones and muscles; in a word, it is a perfect food. It is not too much to say that 95 per cent. of our infants suffer from malnutrition on this account. The mothers also for want of milk-diet and proper nutrition can afford to give very little milk to their suckling babes.

Throughout Bengal specially in North and West Bengal a couple of months after cessation of rains the grass begins to dry up and as there is no arrangement for irrigation the fodder scarcity is keenly felt. It might be urged that as in the jute growing districts the agriculturists get cash money in their hands, they ought to be in a position to lay by or store up fodder for the cattle. Unfortunately this is by no means the case. When they have money in their hands they are eager to purchase all manner of showy and shoddy imported articles, and they are found to be improvident in this respect.

If a reference is made to the imports from the Port of Calcutta it will be found that extensive quantities of oil-cakes are shipped off to Japan and other countries. Moreover owing to the scarcity of fuel dried cowdung cakes are used instead. This represents so much valuable manurial loss.

Agricultural education.—My considered opinion is that unless we have compulsory primary education introduced there is no use having research institutes of the types we have in Pusa and elsewhere. The researches carried on in these institutions on the comparative values of phosphatic, nitrogenous and potash fertilisers and the improved strains of rice, wheat, sugarcane, etc., by means of imported varieties or of cross fertilisation are good in their own way, but, I am afraid very little benefit is derived by the illiterate peasantry, who are conservative to the back bone.

Agricultural industries.—I referred above to my experiences in Khulna and in North Bengal. In both these regions there is practically one principal crop and main-stay of the people, I mean the paddy. This gives occupation to the people

for barely three or four months. The remaining eight months or so they sit absolutely idle. If they would utilise a fraction of their time in some subsidiary occupations not only would their condition be improved but during failure of crops due to drought or flood, they would have a second string to their bow. These people as a rule are hopelessly in debt both to the landholder as also to the *mahajan*. On mature consideration I have come to the conclusion that the *charka* (spinning wheel) is the only machinery which can be brought home to the door of every peasant in the hamlet. In short, the spinning wheel and its accessory the handloom can *par excellence* be called the home industry of Bengal or for the matter of that of the whole of India. During the last five years I have travelled throughout the length and breadth of India and of Bengal more than fifty thousand miles preaching the gospel of *charka*.

Oral Evidence

22673. *The Chairman* : Sir P. C. Ray, you are a Professor in the University College of Science and Technology, Calcutta?—Yes.

22674. You have provided us with a note of the evidence which you desire to give the Commission. Do you desire to say anything at this stage apart from what you have written in your note?—As it was drawn up in a very great hurry yesterday immediately after my return journey from Madras, I forgot to add, with reference to the deterioration of cattle, that in the days of my childhood there was a Hindu custom of setting at liberty a number of bulls.

22675. You refer to the custom of dedicating Brahmini bulls?—Yes. Within recent years these bulls are not allowed to roam at large; they are caught hold of because they eat up all the grains in the fields, and they are sent to the cattle-pound and sold by auction. So, that system has practically ceased to exist, with the result that we have no breeding bulls except the few kept by the District Boards which are not available to most of the people.

22676. We have had evidence before the Commission to suggest that the quality of the animals dedicated was not so good as it was in old days. Do you agree with that?—Yes.

22677. Your note touches two points, the importance of cattle in relation to agriculture and to the welfare of the population?—Yes, in relation to milk supply.

22678. And your belief in the extent to which the home industries of this country might be revived to the great advantage of the rural population?—Yes.

22679. On the first point, in the improvement of cattle, one of the principal difficulties in this Presidency is the provision of fodder and food supply for these animals?—Yes.

22680. How used that to be provided in those old days to which you have made reference?—There was not so much pressure on the land then. During the last half century, of which I can speak from my personal knowledge, owing to the extensive cultivation of jute and also owing to the fact that many people who used to derive their livelihood from a variety of other occupations which I have enumerated, village weavers, boatmen, smiths, have had morsels of their bread snatched away from them, there is undue pressure on the land. That means no more commons and pasture lands are available in the villages. In my childhood days, more than half a century ago, every village had from time immemorial, commons or pasture lands set apart. All those have now been fenced round, and it has become very difficult for people to maintain cows or cattle.

22681. Was there any method of preserving fodder in the old days?—The only thing was that dried straw used to be piled up. It is done to a certain extent now, but not to the same extent. It is strange that milk is more plentiful and comparatively cheaper and richer in London, Edinburgh and other cities of England, not to speak of France, than in Bengal; and condensed milk, Swiss milk, Nestle's milk, go to maintain our babies chiefly, even in remote villages.

22682. *Mr. Kamat* : Even in villages?—Even in villages. The price of milk in villages is 2½ seers per rupee.

22683. Condensed milk in villages?—Yes. You will find it in the groceries.

22684. *The Chairman* : Would you agree that the diet of the cultivator in Bengal is peculiarly deficient in just those qualities which milk would supply?—Yes, especially for the infants and babies, because as a chemist I can say that milk is the only food which contains all the bone and muscle-building elements.

22685. And in the days that you first remember, was more milk consumed by the cultivator?—Yes. Milk was priced at 32 seers per rupee in the district of Khulna, my place.

22686. How long ago?—Fifty-five years ago.

22687. What is the price in that district now?—Even in the best season, when for some two or three months milk ought to be cheap, the price is 8 seers per rupee, but during the rest of the year, only 2 to 2½ seers per rupee, *i.e.*, 8 annas or 6 annas per seer.

22688. When you first remember the countryside with which you are familiar, was jute grown there?—Very little jute was grown.

22689. What food crops were grown?—Chiefly paddy in the *kharif* and mustard and some pulses in the *rabi* season. Paddy was the chief crop there.

22690. What do you say about the standard of living of to-day as compared with the standard of living which you first remember?—Of course, owing to the increased prices of jute and of paddy there has been certainly a larger circulation of money, but I find the largest proportion of that money is sent away for the purchase of foreign imported goods, for which our ignorant rustics have a kind of fancy, showy, shoddy imported goods.

22691. Would you agree that the substitution of a money crop for a food crop is an advantage, provided the extra wealth is well spent?—Yes; I have alluded to it. If they were intelligent, they could lay it by in the savings bank or they could utilise it in purchasing fodder, oil-cake, brain and other such things, but they do not do it. They are so improvident that if they find any money in their hands they are in a hurry to get rid of it in the minimum of time.

22692. Most of us know the feeling ourselves very well?—Last year, when I was in Dacca and Narayanganj, jute rose to such fabulous prices that it was selling at Rs. 25 or Rs. 30 per maund, and there has been such a rush for the cultivation of jute this year that the price of jute has fallen down below the price at which it can be economically cultivated. I know in many fields jute has been allowed to rot; the peasant says that it does not pay to employ labour to cut it down and steep it.

22693. *Professor Gangulee*: That is bad speculation?—You cannot help it; every one wants to be rich beyond the dreams of avarice, and every available plot of land was cultivated with jute.

22694. *The Chairman*: In your recollection has the problem of rural debt altered?—Not at all. I think the peasantry are still hopelessly in debt. All that they do in good years is to pay off interest to the moneylender and to clear off interest and part of the rent due to the zamindar or landholder, and they carry on the burden of debt not only from year to year, but I should say from generation to generation.

22695. When you first remember the district, there was very little jute grown?—Yes.

22696. Was there much debt in those days?—There was debt no doubt, but not to the extent to which there is to-day.

22697. What was the effect in the earlier years of jute being grown as a crop? Was the original debt paid off to some extent?—I do not think so. As I have said, there have been other causes at work driving the people to the land. There were subsidiary industries which went to maintain a large percentage of the population. I read only recently that 70 or 75 years ago in the district of Rajshahi 50 per cent. of the people used to be employed as boatmen in river navigation, that is the report of the Collector of that district, but all those people, thanks to the rapid means of communication by steamships, have been driven to the land.

22698. *Dr. Hyder*: Was that an occupation from the beginning of the year to the end of the year?—Throughout the year, because all the rivers in my days of childhood used to be navigated with country boats; they were laden with export and import articles. Then, again, Manchester cloth and Japanese textiles had not entered so largely into the economic life of Bengal, and the cloth industry used to give occupation to a large number of weavers and spinners.

22699. Were they engaged in the transport of goods from upcountry in the absence of railways?—Yes; especially in Lower Bengal, which is intersected with rivers, there was a large number of men employed in navigation by means of country boats with a tonnage of 1,000 to 1,500 maunds.

22700. *The Chairman*: What about the health of the population compared with old days?—The health has deteriorated comparatively.

22701. Are you quite sure of that?—Yes, especially, the ravages of malaria were almost unknown 50 or 60 years ago. I am myself very fond of spending at least a month in my own native village. I once made bold to stay there when the rains commenced, but I had to pay a heavy penalty, because I caught malaria, and it took me fully a year to shake it off. Now, excepting in the months of April, May and June, it is not safe to reside in any of the villages in Bengal.

22702. That may be due to less efficient drainage of the land?—Yes. My friend Rai Bahadur Bannerji hails from a place called Suri; ten or fifteen years ago, it was

regarded as a sanatorium of Bengal, but now it is very malarious. It is difficult to say to what it is due; some say it is due to railway embankments, but I know many villages where there are no railway embankments, and the ravages of malaria there are as great as in any other place.

22703. That may be due to the congregation at the sanatorium of as many infected people as it could hold, and the consequent spread of malaria into the district now, and it may also be due to poorer nourishment?—That is what Dr. Bentley says; he says it is due to malnutrition that the resisting power of the people has disappeared.

22704. Have you, yourself formed any view on that problem?—I have read and studied a good deal about it; I think it is one of the causes.

22705. Can you suggest any other causes?—The absenteeism of the intelligentsia and of the zamindars and landlords. They are all now absentee landlords, and they care very little about the sanitary conditions of the villages in which they once resided. The result is that the tanks and the roads have been allowed to get into a very miserable condition; there are water pools everywhere, there is no sufficient arrangement for drainage, and these are prolific breeding grounds for mosquitoes and so forth. I say that the absenteeism of the landlords is a curse. In fact, on the occasion of the opening of an exhibition, I said in the presence of the Magistrate of Khulna and some of the biggest landlords of the district that there ought to be a Bill introduced into the Legislative Council, compelling every landlord to spend at least four or five months of the year in his own zamindari; otherwise, he should be disqualified.

22706. In your recollection, is this problem of absentee landlords more acute than it used to be?—I should say it is ten times more acute. Any landlord who has got sufficient means now makes a point of deserting his own village and living in Calcutta in luxurious style; he gets into debt, and leaves the tenantry entirely at the mercy of the *sowcars* and his agents.

22707. *The Raja of Parlakimedi*: Is not malaria also responsible to some extent?—Yes; I have said that before. But the absenteeism of the landlords is also responsible. It is a terrible sight to see palatial residences of landlords crumbling to pieces; they do not care to live there but must have a separate establishment with all the paraphernalia of their position; they spend all their money in cities and all the money is drained out of the land.

22708. *The Chairman*: That movement, I take it, in your view, deprives the countryside of those who should be its natural leaders?—Yes, quite so; a resident landlord is always a blessing, even if he be extortionate, because the money flows back into the pockets of the people, and he would take care to have a good supply of drinking water at any rate.

22709. Next time any of my tenants complain, I shall remember that dictum?—I have some knowledge of Scotland, I have lived there more than six years, and I know something about the Sutherland clearances, when Professor Blackie was the champion of the people.

22710. Now, a word or two on this question of spare-time occupations. You are concerned, I understand from your note, to advocate in the main an attempt to spread by means of propaganda, the practice of making those things in the home which are required in the home?—Yes.

22711. You are not so much concerned to attempt home industries producing goods for markets outside the district?—In my part of the district, during successive failures of crops the people were supported, and even now they are supported, by making mats out of a kind of reed growing in the water-logged areas. These reeds are woven into mats, and there is an extensive export trade in those mats. If you go to Assasuni in the district of Khulna, you will find that the inland steamers there are maintained mainly by the carriage of mats, and the people during the bad years manage to live pretty well. I should have recourse to local conditions; I would not have only the *charka*; I would have as many local subsidiary industries as possible.

22712. Is mat-making, which you mention, one of those industries where the home craftsman can compete with more highly organised labour?—Yes; these mats have an extensive sale throughout Upper Bengal and even in Upper India; in the Midnapore district also another kind of mat called *shital pati* is made.

22713. Do you think that there would be any future before the mat-weaving industry in attempting to dispose of its goods in the open market?—No; these

are dependent upon local conditions; these mats can only be manufactured in those areas where you have that kind of weed growing; it does not grow everywhere. In peculiarly favoured areas you can have some such local industry.

22714. Remembering that the cultivator is handicapped for many months in the year, it would be of course a great saving on his budget if he could make the cloth which he requires for his own use?—Yes, and use the spinning wheel of which I am a great propagandist.

22715. A great deal of effort and, I suppose, of money has been put into this propaganda?—Yes.

22716. What has been the result?—The result has not been as satisfactory as it ought to be. The reason is that the modern accessories of so-called civilisation have compelled the people to be lazy. I shall explain it in a word. You have motor buses constantly plying in the streets of Calcutta and also from Calcutta to the mofussil. Formerly, I noticed that the peasantry class used to walk on foot ten to twelve miles very rapidly. Now that these motor buses are plying, they get into them and pay, say, 2 annas. In that way idleness is being encouraged; we are putting a premium upon idleness. I read the other day that Carlyle used to walk a hundred miles on foot to Edinburgh, and it was the custom then that scholars were supported on the way. We have now got any number of motor buses and railway communication, and that has made the people lazy. It does not matter with Scotland, where the people are wide awake and where there is an immense accession of wealth. I know my friend Prof. Gangulee has personal experience of that part of Bengal which was the scene of the late floods. I find that formerly for the distance of 5 or 6 miles between one station and another, the peasants used to walk on foot. These rustics have no idea of time. Now they sit at the railway station for a couple of hours waiting for the train to come, they pay an anna or two and then go to the next station. In a country where for nine months in the year the people are absolutely idle, what does it matter if they do not save time in that way? It may be an important matter to an American, or to an Englishman, or to a business man in Europe to save time in that way, but here the question, as I have often said, is not how to utilise time but how to kill time, and with such people these accessories of modern civilisation have proved to be a curse; it has encouraged idleness and indolence.

22717. Would you suggest doing away with these buses?—I would not, but I am giving an example of how these incorrigible habits of idleness are being encouraged; we put a premium upon idleness.

22718. In your experience, is drink a growing evil in the mofussil?—Not in the mofussil; it is a growing evil in those centres where you have modern industries, centres where you have jute mills, where you have cotton mills and in the tea gardens; it is not a growing evil so much in the villages as yet; the population as a rule is yet sober, but I know in Khulna amongst certain classes drink is spreading very rapidly and working havoc with them.

22719. You do not find that drink is an acute problem amongst the truly rural population?—Not yet; but in certain parts where the peasants are very prosperous drink is penetrating quite rapidly; it is not a case of peaceful penetration, but it is a case of rapid entry.

22720. How about the use of tobacco; do you think the habit of smoking cigarettes is spreading?—Yes, and that is one of my subjects of discussion wherever I go. In Rangpur, Cooch Bihar and Bezwada, you have the centres of tobacco cultivation, and it so happens that even in places which are the very fountain-heads of tobacco cultivation, you have the " Hawa Gari ", the " Three Castles ", the " Elephant " and a number of other brands of cigarettes commanding a rapid and extensive sale. There I tell them that it is a case of carrying coals to Newcastle. People will not buy the locally produced coal, but they will import coal at ten times the price and allow their own coal to lie and rot. Formerly, they used to smoke what is called the *hooka*, and for a farthing it would last half an hour. Now they have beautiful cigarettes and along with them the sale of matches has also gone up by leaps and bounds.

22721. *Sir Ganga Ram* : Why do you not teach them to make cheap cigarettes?—They are making *biris*.

22722. They are no good; I have smoked them. Why do you not ask them to make good cigarettes?—It is for men like you who are the educated people to start industries and not to sit idle. My indictment against my educated countrymen, especially men returned from England, is that they have adopted all the

vices of the West *minus* the good qualities. They sit idle and smoke cigars and cigarettes and drive in motor-cars and do not create anything; they are the worst enemies of *swadeshi* articles.

22723. *Mr. Kamat*: Are women taking to cigarettes?—In certain "civilised and fashionable" centres they do smoke. But this is not the case with all the women.

22724. *The Chairman*: Do you notice amongst the rural population any growing demand for the services of the Agricultural Department?—Not much. I have noticed in Faridpur and in some other districts that there is a very great run on the improved varieties of jute seeds. That is certainly to the credit of the Department because they know that weight for weight the standardised seeds supplied by the Agricultural Department yield a far better crop.

22725. That is widely recognised?—Yes; and I believe some strains of paddy also are recognised. In some cases, I believe, sugarcane has also improved.

22726. *Sir James MacKenna*: Just a question about Scotland. Do you not think that Thomas Carlyle would have taken a motor car from Ecclefecham to Edinburgh if one had been available?—I have read in Froude's biography of Carlyle that people have lost that old habit of self-reliance.

22727. You think Thomas Carlyle would have?—Even when I was at Edinburgh I could have my breakfast for one penny. I returned from Edinburgh only a few months ago; I was again there with my old friend Sir James Walker who is now Professor of Chemistry, and Lady Walker told me that oatmeal porridge had migrated more to England and Scotch people were fond of ham, mutton chops and things of that kind. On board the steamer also I found that oatmeal porridge was very much in vogue.

22728. I think I had better leave my native country alone. Just a question about chemistry. You are a very experienced research worker and teacher of chemistry. The Commission would like to have your frank opinion about the capacity of Indian students for research in chemistry and physics?—I think the Indians have been able to give as good an account of themselves as any one else. We have our Journal of the Indian Chemical Society. Three years ago there were so many papers communicated to the London Chemical Society that they could barely make room for them. Even in London they have only one journal for the whole English-speaking world. They had to appeal to the authors of papers to cut down the size of their papers as much as they could. Now, we are running a journal of our own and I find we are getting as many original papers as one could fairly wish to have.

22729. Is the standard of research good?—It is a very delicate question for me to answer. In fact, we have got unsolicited testimonials and they all say that our output both in quality and in quantity would compare favourably with any such papers published in Europe or America. I think our chemists can hold their own. My pupils are now holding almost all the chairs throughout India.

22730. What are your views about the milk-supply?—I only wanted to say that if the cows are well fed you could get more milk from them. I was in England about six years ago and I heard that a single cow gave as much as 82 pounds of milk, equivalent to one maund. Of course, that was a record case. She was milked four or five times during the day; that shows the immense capability of the cow as a source of milk.

22731. Was that a Scotch cow or an English cow?—It was an English cow. The average yield in England, I suppose, is half a maund. I visited purposely a dairy farm this time in England and I found that great care is taken of them especially by the Health Department.

22732. *Professor Gangulee*: They take great care of the cow, although they do not worship her?—Yes.

22733. I should like to ask you a few questions about your experience with central co-operative anti-malarial societies. Are you familiar with those societies?—I am one of the Honorary Vice-Presidents of the society of which Dr. Gopal Chandra Chatterjee is the head. I have not had much experience of it. I had been once or twice to his place, Shukchar.

22734. You have had no occasion to study the details of this movement?—I am afraid not.

22735. Could you tell us whether these anti-malarial societies are assisted by Local Self-Government bodies?—They are assisted by Local Self-Government

bodies. If they are properly worked, they are capable of doing immense work for the country. It all depends upon the working and upon the local co-operation which you can secure.

22736. That is precisely the point I wanted to get from you. Do you think that these anti-malarial societies have interested the Local Self-Government bodies sufficiently to take up the work themselves?—Only in certain cases.

22737. I think your Bengal Chemical Works took some interest in deep tube wells?—Yes, they did.

22738. Are you familiar with the rural conditions with regard to the position of the drinking water-supply?—All I can say is that we are having extensive orders and the department is flooded with them. In fact, in the Bengal Chemical Works we have had to open a separate department for tube wells and in many districts we are full of work. That goes to show that these tube wells are very popular. They must have been a blessing to the persons, otherwise our department would not have been so popular.

22739. So you find that there is a great deal of demand for tube wells?—Yes

22740. How long did it take you to create this demand? When did you start these tube well sinking operations?—We started these operations on our own account; that was about five or six years ago.

22741. Within these five or six years there has been a great deal of demand for these tube wells from different parts of the Province?—Yes.

22742. And you are able to supply the demand?—Barely.

22743. You have manufactured these tube wells yourself?—The pipes are not made by us. But all the other things, such as borings and fittings are of course made by us.

22744. You must have a number of engineers to inspect the works?—Yes.

22745. What is the cost per tube well?—It all depends upon the description of the tube wells. We have supplied five or six tube wells to the Calcutta Municipality in the suburbs of Calcutta and the average depth of the boring was 220 feet. Their cost was between five and six thousand rupees. It all depends upon the depth of the boring.

22746. *Sir Ganga Ram*: And also on the size of the tube?—Yes on the diameter of the tube.

22747. Were they all for drinking purposes or also for irrigation purposes?—They were all for drinking purposes.

22748. *Professor Gangulee*: Could you give us an idea of the cost of a tube well dug in the rural areas?—Unless you have deep boring the quality of water cannot be depended upon. In many places boring up to 220 feet is quite enough, but I know in one case in Noakhali the boring went five to six hundred feet deeper and yet we had salt water. The geological formation of lower Bengal is so very peculiar that no two districts would agree in that respect.

22749. Do I then understand from you that there is scope for sinking such wells?—There is ample scope, especially for irrigation purposes. If grass and fodder can be kept alive by means of irrigation with the help of these tube wells, they will have a grand future. In fact, I had an opportunity about a year and a half ago of paying a surprise visit to the village of Mr. A. C. Bannerji and I was struck by what an intelligent and patriotic person who has some sort of love for his own native village can do to improve it. He has made improved arrangements for water storage and I found his agricultural produce and the pasture in a thriving condition, whereas the surrounding places gave one the impression of something like a desert.

22750. Do these demands come from the local bodies or the District Boards or Village Unions?—So far they have been coming from the District Boards.

22751. Have you received any demands from individual farmers?—Some private individuals have also sent orders for them.

22752. With regard to your Chemical Works, do you manufacture any artificial manure?—Our biggest expansion at Panihati was due to a very large improved plant for sulphuric acid. Six years ago I purposely paid a visit to the works near Edinburgh where they are making immense quantities of manure from superphosphate of lime as it is called, and we have also started manufacturing manure from superphosphate.

Sir P. C. Ray.

22753. But you cannot get fossil phosphate in this country?—That is the chief stumbling block. We cannot get coprolite as it is called. At present we have not been able to work it because there is little demand for that kind of manure.

22754. Do you consider one can make superphosphate out of bones?—Yes; but it will not pay.

22755. Are you familiar with some of the chemical works in the Bombay Presidency which are carrying on superphosphate works?—Yes, but they are not doing well.

22756. Why? Is there no demand?—It was overcapitalised. It was started during the days of the boom immediately after the War and they went on spending money right and left.

22757. I want to know whether one could manufacture superphosphate in this country with bones?—I think you will get the best possible information if you refer to Messrs. Parry & Co., Madras. They will be able to give you better information. On the Bengal side there is absolutely no demand for phosphatic manures.

22758. On page 365 you want to see each village a self-contained republic and an autonomous unit?—Yes, I have also used that very expression.

22759. Do you think the tendencies are favourable?—No.

22760. How would you proceed to achieve this dream?—It is very difficult to say. It is a dream of old. Everything is now upside down.

22761. So we have to adjust ourselves?—We must.

22762. And we need not waste our time on dreams?—I am a *charka* upholder and I am supposed to be as good an up-to-date industrialist as you could wish to find.

22763. With regard to Manchester goods being responsible for throwing a large number of weavers out of employment would you not include the Indian mills as being equally guilty?—Indian mills barely touch the fringe of the whole question, because you know the products of the Bombay looms used to have a market in China and the Persian Gulf littoral. Of course, they have now to depend more on the Indian market, but hitherto they could only spin up to below 30 counts for which there was not much demand in India, especially in Bengal because we go in for finer stuffs.

22764. Would you call the spinning and weaving industry a subsidiary industry to agriculture?—Yes, certainly.

22765. Are weavers also cultivators?—Some of them are.

22766. Has that been the case in the past? Was not there a caste of weavers by themselves who did not cultivate?—Yes, the *Jola* and *Tanti*, you know.

22767. They are cultivators?—No; they were not cultivators in the past but now practically they are, as their bread has been snatched away from their mouths.

22768. So they are now cultivators?—Yes, mainly.

22769. I want to get from you whether you would call spinning and weaving a subsidiary industry to agriculture?—Yes, certainly. It will not maintain you by itself, as I said. Nine months in the year and in some places six months in the year they sit absolutely idle. But in these days of keen competition, when India has been thrown into the vortex of world competition, is it possible for any people to live idly for six or nine months in the year and complain of their lot?

22770. No; the point is this. In your propaganda work you have been trying to introduce the spinning wheel. But who are the people who have taken to it? Have the cultivators taken to it or the weavers?—No, the cultivators. It is especially successful in the Chittagong district even where the tradition survived to a large extent and there also the cultivators say " Why should we not utilise the off-time if we can earn extra two-pice?"

22771. So your experience is this, that this propaganda of yours has resulted in introducing the *charka* as a spare-time occupation?—As a spare-time occupation, yes, as a subsidiary one.

22772. In answer to the Chairman you said that your success in the propaganda was not what you would like to see?—Yes; it will take time.

22773. Would you be prepared to tell the Commission some of the inherent weaknesses of that propaganda?—The inveterate conservatism of the people. We

have lost the tradition for nearly a century. Very few people had even seen a *charka*, whereas a century ago, take the case of Bengal; after supplying the whole wants of Bengal, Dacca, Santipur and other places used to export to the extent of 2 crores worth of muslins; and 2 crores in those days, it is in Mr. R. C. Dutt's Economic History of India and I think Mr. Gupta will be able to tell you better, would be equal to 10 crores at the present day, because at that time the price of paddy was Re. 1 per maund. If that was possible a century ago, why should it not be possible now to revive it?

22774. Regarding your propaganda, would you say that your *charka* or the spinning wheel might have a better chance of success if this movement were not associated with politics?—That is gone; that was only during the first year of non-co-operation. Now it is entirely divorced from politics.

22775. Is it so?—It is practically, it is absolutely carried on on economical grounds.

22776. That is precisely what I wanted to get from you?—Yes; that used to be. The *charka* was something like a red rag to a bull.

22777. Can you tell us something about the economics of the *charka*? Can you tell the Commission how much one might earn per day from hand-spinning?—That depends upon various factors. If you refer to the Tamil Nadu, Mr. Rajagopala Chariar has sent an unofficial memorandum which I saw in the *Hindu*. I suppose a copy of it must have been forwarded to you. It will give you an account of the Tamil Nadu.

22778. His experience is confined to the Madras Presidency. As you are connected with the Bengal Presidency, I should like to get from you how much a cultivator or a weaver might earn by hand-spinning per day?—It is not the weaver who takes to it; it is the women folk who spin really, you see. Even the word "spinster" is derived from spinning. The men seldom have taken to spinning; they help indirectly. They fetch the cotton, card it and so on.

22779. Would you tell us how much he could earn per day?—I have seen in a famine year a man earning at least 2 annas a day. He generally can earn one anna a day.

22780. One anna a day?—Yes.

22781. How much could one earn by hand-weaving if the yarn is brought from the mills?—I have seen them earning as much as a rupee or Rs. 1-4-0 if they use mill yarn.

22782. Would you then recommend hand-weaving in preference to hand-spinning or would you connect the two?—The two must go side by side.

22783. Must they?—Yes; one cannot exist without the other.

22784. Why can you not weave with mill yarn?—If you spin yarn, the yarn must be utilised in weaving, so the two industries are inter-dependent.

22785. Hand-spinning and hand-weaving?—Yes.

22786. Are not mill-spinning and hand-weaving possible?—There are now a great many, your Agricultural Department will give you statistics, there are a few lakhs in India who earn their livelihood by using mill yarn; there is no doubt about that.

22787. That is precisely my point, because economically it is a more paying proposition. Now, is it true to say that spinning was at one time, as you have mentioned here, the universal subsidiary industry of India?—It is true; otherwise how could the demand of the whole of India have been met and how could India have exported so much? I read that Pliny, the Roman Historian, complained that the Roman Patricians were so fond of the Dacca muslins that the wealth of Rome was drained away to India.

22788. That does not explain my point.

22789. *Dr. Hyder*: That was not due to the love of the Romans for the muslins alone?—There may be others.

22790. That is one of the items?—Yes.

22791. *Professor Gangulee*: That does not prove the universality of the *charka* as a subsidiary industry throughout the country, does it?—Otherwise how could the entire population have been clothed?

22792. The population was far less than it is now?—I only wanted to draw the attention of the Commission to one fact. How is it that a tiny little country like

Denmark after supplying her own needs as far as the dairy produce is concerned, supplies even England? Danish butter I find in many parts in England.

22793. Better organisation?—I have not much experience about that. I only wanted to say that.

22794. *Mr. Kamat*: You said a woman working the *charka* about, say, eight hours a day can make about one anna to two annas?—Yes.

22795. I want to know whether in competition with this there are not other spare-time occupations to which women might take in the villages?—I do not find any. As I said, the *charka* is the only thing ready at hand. It costs barely Rs. 2-8-0; it will last for two or three generations and you can take it up any time you like and give it up any time you like. It does not require much capital; it does not require any organisation. Supposing you introduce a Singer sewing machine, that would mean so much cloth to be kept in stock; then again, there would have to be an agency for the sale of the production and so on. But if you have a *charka* it is so very simple.

22796. I know the value of the *charka*. In fact, I am looking at it purely from the agricultural point of view and the spare-time occupation point of view?—I have just returned from Mysore and Bangalore. There the Maharaja, through the Department of Agriculture, through the Minister of Industries, has encouraged the use of the *charka* amongst the village folk and I was taken to some of these villages.

22797. The point I was coming to is this; with every desire to see the possibility of the *charka*, recently in the Bombay Agricultural Exhibition, we went into the question of the economics of it and invited the All-India Spinners' Association at Ahmedabad, which Mr. Gandhi has started, to give us a demonstration of it. But the whole point is this. If it can only earn one pice per hour, can it stand competition with other spare-time occupations, knowing human nature as we do?—But there are none others that I know of.

22798. Not, say mat-making?—As I said, it is only suitable to those areas where that kind of reed grows.

22799. Rope making?—No, because it will not give occupation to the entire people. Next to food, clothing is the greatest necessary of life. If every one were to take to mat-making, there would be such a surfeit of mats that you would have to burn them.

22800. You have been unable to show us why the *charka* has not been taken up during the last four years in greater proportion, if really as you say, it is a good spare-time occupation?—As I said, we have to go against the inveterate habits of the people.

22801. Is it the habits or is it the economically low value?—Nothing of the kind. What is the average income of an agriculturist? That you know better. Following Naoroji's or Romesh Chandra Dutt's statistics, it may not be one anna a day. Suppose it is two annas a day. If the average income is even two annas a day, then if they could earn two pice that would mean 25 per cent. increase on their income. So it should not be judged from your and my point of view.

22802. We shall leave that subject. I want to ask you about chemical matters. In Calcutta, to start a small chemical industry there is no dearth or want of capital, I suppose?—Well, we Bengalis have been always lacking in business instincts. I have been crying myself hoarse over that for the last 30 years and my public writings and speeches would amount to a big volume, I am afraid.

22803. That is exactly the whole thing. With your great knowledge of chemistry, I want to know why, in this Province, chemistry has not been applied to commercial purposes, to produce articles which, you said, people are importing and spending money on?—Because of the backwardness of the Bengali in matters of trade, commerce and industry. We have the hereditary love of books only. We can produce research scholars who can hold their own; but when it comes to application of chemical knowledge to industries, the Bengalis are absolutely nowhere.

Thank you for your frankness.

22804. *Rao Bahadur Bannerji*: Is there not a variety of *charka* called *shoral charka* invented by Priyanath Datta which they say will give as much yarn a day by spinning as will give you a daily profit of at least Re. 1?—Nothing of the kind; it is all moon-shine. The *charka* we are using has been introduced by the Manager and the Factory Superintendent of the Bengal Chemical Works, both of whom are thoroughly up-to-date and conversant with mechanical matters, and I think it

has been accepted throughout India as giving the best outturn; it is also very easy to work.

22805. How much can a man earn with that per day?—It all depends on the number of hours he can devote to it.

22806. In your notes on agricultural education you have been pleased to say, "My considered opinion is that unless we have compulsory education introduced there is no use having research institutes" etc. That compulsory education will be free?—Free.

22807. It will require a very large amount of funds?—Yes.

22808. So that unless the Government of Bengal can come forward with the necessary funds or unless the people agree to pay an educational cess, there is no hope for it?—No.

22809. Will the people of Bengal agree to pay a small educational cess?—Well, you know the people of Bengal better than I do. Even if the Government is not willing, I think it lies with us to find the ways and means. I remember when the late Mr. Gokhale, who was the great apostle of compulsory primary education, first came to Bengal years ago, he did not find much support for compulsory primary education among the local Calcutta leaders. Then he went to East Bengal to Nawab Ali Chaudhuri, now of the Executive Council, who said that even if the Hindus would stand aloof, he as a Mussalman leader would recommend the levying of a special cess from among his own co-religionists so that the people might have the advantage of compulsory primary education, because in East Bengal 80 per cent. of the people are of the Mussulman faith, and it is the Mussulmans who would be really benefited by compulsory primary education. Personally I recommend that the Government should pay half and we should pay half.

22810. *Sir Henry Lawrence*: You have mentioned that men will not spin; they leave it to the women?—Generally that has been the case everywhere; "When Adam delved and Eve span."

22811. Does that refer to every community?—I think in the history of the world you will find spinning generally confined to women; I suppose it is because they have more patience.

22812. Then your advocacy of the *charka* is being addressed to the women of India and not to the men?—I do not say that. I should welcome the help of men because they also sit idle during six or nine months of the year; but you must take things as they are, and generally I find spinning is confined to women.

22813. Is that the experience of the movement in every Province in India?—Yes, I think so.

22814. Then I must be mistaken, because I understood Mahatma Gandhi was appealing to the men?—Yes, he is, but in Bengal I find that in spite of the appeal it is the women who are left to do the work. The men help them in other ways, bringing cotton, ginning, carding and so on.

22815. *The Chairman*: They give moral support possibly?—No, not only that; they carry the material to market for sale.

22816. *Sir Henry Lawrence*: In those golden days when India supplied these muslins outside India, you say she had an export trade of 2 crores?—It was 2 crores only about a century ago; you will find it in Mr. R. C. Dutt's Economic History of British India.

22817. I do not understand?—I think Mr. Gupta will be able to tell you. I have read that book carefully.

22818. *Professor Gangulee*: You pin pour faith to the economic principles of R. C. Dutt?—Well, not entirely; but you must move with the times, and I remember that particular passage which he quotes from Wilson that the foreign rulers of India used the arm of political injustice to keep down and ultimately strangle a competitor with which it could not compete on fair and equal terms.

22819. *Sir Henry Lawrence*: My question was with reference to the statement you made that a century ago the export trade was 2 crores?—Yes.

22820. Did I understand you to say it was more than 2 crores?—It is a question of statistics. In Taylor's "Dacca," written years ago there is a vivid account of the hand-loom industry of Dacca.

22821. What I want to get from you is whether at that time this spinning was done by men or by women?—I have put in a printed copy of my "Message of

Khaddar;" it is a big document, but I have marked passages. If you refer to them you will find a reference to Dr. Francis Buchanan's tour throughout India; he gives the figures district by district. I am quoting from memory; it is engraved on my memory; he says in Rangpur he found ladies of even respectable classes in the afternoon sitting up certain hours and taking to spinning; and Rangpur over and above supplying her own needs, used to export yarn. If you will kindly refer to the copy which I have sent to the Commission you will find all the figures given there.

22822. I want to get some idea of the economic possibilities of this policy that you are preaching. I want to know whether there is any prejudice on the part of ordinary castes and higher castes against allowing their women to spin?—No prejudice whatever; even respectable classes, Brahmin ladies, used to spin. There is no caste prejudice as far as spinning is concerned.

22823. Does that apply to Bengal or to other parts of India?—My knowledge is confined more to Bengal.

22824. And in regard to the Mahommedan community?—It is the Mahommedan community which is really foremost in spinning.

22825. There is no prejudice amongst the higher or any grade of that community against allowing their women to spin?—No; in fact in Bengal it is the Moslem community which is the backbone of the spinning industry.

22826. You have had considerable success?—In some communities, yes, where the tradition survived and where people only required a little stimulus.

22827. Where the tradition survived?—Yes.

22828. Where is that: East Bengal?—No, in the Chittagong Division.

22829. Where there is some cotton grown?—There is hill cotton, yes; Chittagong cotton is well known. It is only of short staple.

22830. Do you find any difficulty in supplying the raw cotton in other parts of Bengal where cotton is not grown?—Yes, there is difficulty because we are supplying them with imported cotton.

22831. From the Central Provinces?—Yes.

22832. You convey that cotton from the Central Provinces to the homes of these people in North Bengal?—Yes.

22833. And when it has been conveyed there then they work on this cotton and earn 1 anna a day; does that pay for the railway transport?—Well, at present it is not so convenient certainly.

22834. I do not want to know about convenience; I want to know about economic possibilities. Does it pay for the railway transport?—It does not pay; that is the reason that the cotton is highly priced; but we are trying also to have cultivation of the cotton. There are several places in which cotton used to be grown, and where it is grown on a small scale now. There is a place not far from Calcutta which is called Kapasdunga, that is a place where cotton used to be grown; we are trying to introduce the cultivation of cotton side by side with spinning.

22835. Then do I understand the possibilities of this economic development are limited to ,those areas in which you can get cotton growing in the fields of the ryots?—Yes, especially so.

22836. That is your view?—Yes.

22837. You spoke of the difficulty of getting business occupations taken up by the Bengalis?—Yes.

22838. You say the Bengali is especially good at research as opposed to business?—Yes.

22839. Is he equally good at applying his research?—I am afraid not, not for practical purposes. In applied chemistry also the Bengali has hitherto proved to be a failure. You see there are 82 or more jute mills on the banks of the Hooghly; not a single one of them is owned by a Bengali.

22840. *Professor Gangulee*: Why not?—Because the Bengali is backward in industries and business capacity.

22841. *Sir Henry Lawrence*: Is it ,not possible to train him to it?—Well, there are one or two exceptions; for instance there is Sir R. N. Mukerjee who is perhaps *par excellence* the captain of industry in Bengal. That shows the capability of the Bengali intellect, and shows that given the proper push and encouragement,

there is no reason why the Bengali should not succeed in industry. In my humble way I began the Bengal chemical industry with only Rs. 800 in my pocket, and now it has grown to fairly big dimensions. It has been entirely managed from the very beginning by Bengalis. So that there is nothing lacking *ab initio*, but the tradition of the Bengali has been for book learning and logical quibbling.

22842. So that he will not apply his research work to business. Will he apply it to administrative science?—Yes. There is an example (pointing to Mr. Gupta).

22843. Administrative science not as a part of practical business?—I am afraid not; otherwise the Bengalis would not be in their present miserable plight. There are 22 lakhs of Indians in Bengal who are non-Bengalis. They are Parsis, Armenians, Jews, Marwaris, Bhatias, etc., and I have calculated that if you take the average earnings at Rs. 50 a month, 11 crores of the wealth of Bengal is earned and largely drained away by non-Bengalis.

22844. Do they give no service in return?—Very little. The only service is in so far as they consume rice, but unfortunately most of them consume wheat, which is also imported from upper India. I have made that calculation.

22845. *Mr. Kamat*: Do you regard consuming rice as a service?—No, but that portion is left in Bengal.

22846. *Sir Ganga Ram*: With regard to the provision of pasturage, how can you provide land for it, when there is no vacant land?—Action of the kind under the Land Acquisition Act should be taken.

22847. Somebody will have to pay for the land acquired?—You will have to indemnify out of the Village Union fund or the funds of any such corporate body.

22848. Where is the money to come from?—That is the point. Anyhow arrangements must be made for acquiring the land.

22849. The land should be acquired and left for pasturage?—Yes.

22850. We gathered from one witness that 15 per cent. of the population was in comfort, 32 per cent. below comfort, 33 per cent. above want and 20 per cent. were in want?—In East Bengal I should say they are fairly well off, if there is a good jute and paddy crop, *e.g.*, in Barisal and Mymensingh.

22851. It does not apply to the whole of Bengal?—It does not.

22852. If it does not, why should not the starving population move into the better districts?—The land is over-crowded. I know one of the fertile districts, Mymensingh; there is a constant stream of emigration from there to Assam.

22853. Then, why do they not migrate from unprosperous tracts to prosperous tracts?—In the prosperous tracts there is no land available.

22854. They say that in the prosperous tracts there is want of labour?—They come during the harvesting of crops and go away again.

22855. The Conservator of Forests tells us that he cannot get sufficient labour to develop his forests?—There is a reluctance to leave the homesteads. As I have stated, even though the jute mills give occupation to four or five lakhs of people, not even 5 per cent. of them are Bengalis, I might even say not more than 3 per cent.

22856. That ought to be remedied. I appeal to you to take that as a mission instead of what you have now taken, the *charka*?—But, they are very home-loving.

22857. I am only asking questions on agriculture. For these 20 per cent. you must find occupation. The *charka* will not give them enough food?—It is only to utilise the off-time when they sit absolutely idle.

22858. I know you are a great chemist. Can you not invent some fertilisers which will be cheap enough for the cultivator?—We have already some fertilisers. There is cowdung; but .....

22859. The use of cowdung as a fertiliser is vanishing on account of the cost of fuel to replace it. It is all an economic question. In our colonies cowdung is only used for warming milk; for fuel they use cotton stalks. Can you not make nitrate of soda, for example?—Yes; some European firms import it, but very little of it is used.

22860. I ask you as a chemist to give your attention to fertilisers. That is a great problem?—They are just learning to use them. I know bonemeal is used even by the Hindu population in Burdwan; they have overcome the caste prejudice.

22861. You talk of absentee landlords. Do you not think that the absentee landlord is the direct outcome of the Permanent Settlement? They will get the same rent wherever they stay?—Yes, to a certain extent; but they have no business to absent themselves from their land.

22862. Everything has to be considered from the economic point of view. When they have nothing to gain by living there, why should they live there?—Yes; the failure of the Bengalis on the industrial side is also due to the Permanent Settlement.

22863. You mentioned tube wells. What is the size of the tubes?—I do not remember the exact diameter; the manager of our farm will give you the details.

22864. *Sir Thomas Middleton*: In the first paragraph of your note you draw attention to the great need for improving the milk-supply and the cattle of Bengal?—Yes.

22865. Do you regard that as one of the primary objects we ought to aim at?—Yes.

22866. You quote Macaulay to show the position of livestock farming in England in 1685, and you yourself describe what you have seen as a student in Edinburgh. Have you studied how the change from the poverty-stricken animals described by Macaulay to the stately bulls and cows which you describe was brought about in a period of 250 years?—By improved knowledge of agricultural science and of breeding. In England scientific principles penetrate among the general people much more rapidly, whereas here all the theoretical knowledge is confined to a microscopic minority, and our zamindars, especially in Bengal, though some of them are fairly well educated, have been very remiss in their duties; they are expected to take the lead in this matter, but they have hopelessly failed in this respect.

22867. Are you not aware that much of the improvement took place before the landowners of England and Scotland knew anything of scientific principles? It took place between about 1750 and 1825. What was the change that brought that improvement about? Have you studied the question?—England is a land of progress in everything. The history of England, as Macaulay says, is a history of the triumph of progress all along the line.

22868. I was going to ask you if you had studied in detail the history of the improvement of our livestock as given, for example, in Lord Ernle's book "English Farming: Past and Present." There you will find that the improvement began when we enclosed our commons?—I see.

22869. Reading your evidence, I have come to the conclusion that you are a strong advocate of common pastures?—Yes.

22870. But it will not help Bengal; it will make matters worse?—Somehow or other fodder and foodstuffs for the cattle must be found.

22871. How was the foodstuff provided round Edinburgh when you were studying there?—When I was there first I was travelling by the East Coast; but this time I travelled by the Midland Railway, and on every side I found green grass and cattle browsing.

22872. Green grass for the summer?—Yes, for the summer.

22873. And turnips and other food grown for the winter?—Yes.

22874. In Bengal for what length of period do your common pastures provide grass?—Only during the rainy season.

22875. How are you going to improve your cattle if you have not got food for all periods of the year?—Special foodstuffs must be raised during the rainy season.

22876. Then you must turn your attention to fodder crops?—Yes. I may be permitted to say that in England educated and scientific people take a prominent interest as in the Rothamsted farm; these enlightened and well-to-do people do their utmost for agriculture, like Sir Ganga Ram for instance. If we had men like Sir Ganga Ram scattered throughout India, I think the problem might have been solved.

22877. I am only concerned to try and correct your view that the right way of improving the cattle of Bengal is to restore the village commons?—Yes.

22878. That is the wrong way, I think. You must provide food for the cattle all the year round?—Yes.

22879. The next point I ask your opinion on is this; you no doubt know that the dietary of Bengal was studied by Captain McCay some fifteen years ago; do you agree with his conclusions that, generally speaking, the diet is not well balanced?—I am afraid he lays undue stress on the nitrogenous element; his views have been criticised by some Dutch or Danish physiologist.

22880. I know to whom you refer?—They say that even in Irish potatoes there is enough of nutriment, nitrogenous and other. I agree in the main with some of his conclusions, that the average Bengali diet is rather poor in nitrogenous elements.

22881. As a chemist, have you yourself studied the subject of nutrition?—I have done so in a general manner; I have seen, for instance, the analyses of the pulses which are widely used in the dietary.

22882. When you referred to the criticism of Dr. McCay, you quoted the views of the Danish scientist Hemerhede. Have you got any figures of your own on which you can criticise?—No. I have read the book by the American author Chittenden; he also does not lay so much stress upon the richness in nitrogenous element.

22883. That is so, but neither of these experts were dealing with the quality of the foodstuffs that are consumed in Bengal?—There is too much of farinaceous food in Bengal and Madras.

22884. When such criticisms are made about the foodstuffs of Bengal, do you not think it is desirable that chemists should turn their attention to the study of that and verify the point whether Dr. McCay was right or not?—After all, what I mean is that those who have got a good supply of fish, wherein the Bengal rivers abound, get on fairly well even without milk. I am speaking particularly of those persons staying in places where even fish is not available, and our people have a horror of beef or any other meat; if they took to beef, the question would be solved very readily.

22885. I was not thinking of beef but of pulses, crops of which you know the composition very well?—That is the only nitrogenous foodstuff.

22886. Can you explain why they are so much less used in Bengal than in other Provinces? Is it a question of poverty, or custom, or what?—The *dals* are in fairly common use; I have found that where fish is abundant, people do not use pulses. In the districts of Bankura, Birbhum and Burdwan, where fish is scarce, they depend a good deal upon pulses, *dals* as you call them.

22887. *Dr. Hyder*: I want to ask you a few preliminary questions before I take up your note. You stated in your evidence that the Danish cows yielded much more milk than the English cows; do you know why that is so?—They are very well-fed.

22888. Do you know what the character of English or Danish agriculture is?—No; I have seen a little of English agriculture.

22889. Do they go in for stock raising or arable farming?—During the summer months I find it is all arable.

22890. You have your vast plains of Bengal; are they not all covered with paddy?—Yes.

22891. You have to make a choice here, either paddy or cattle?—Either paddy or cattle, or jute.

22892. Provided your methods do not improve, you must devote the land either to the feeding of the population or to the increase of milk; if you increase the milk-supply, there must be a shortage of paddy somewhere?—Yes.

22893. You say that the cultivators of Bengal are idle for 6 to 9 months?—Yes; in many parts of the district of Khulna, paddy land is prevented by means of embankments from being spoiled by the inrush of salt-water, and there you have only one crop.

22894. Turning to your note of evidence, you say: "Imported cutlery has also played havoc with the village smith." Are you referring there to the things made by the village blacksmith, ploughshares, for example?—Not ploughshares; I refer to knives, scissors, spades, etc. Even now, these are supplied by German and Japanese manufacturers; they are not so much of British manufacture.

22895. With what do your people cut mangoes when they eat them?—With imported knives.

22896. That is not so in the United Provinces. In the different centres in the United Provinces mangoes are still cut with a country knife?—The blacksmiths in Bengal are losing their bread.

22897. With regard to the question of occupation, you say there were a number of boatmen, but do you not think that the people have changed their occupations? The number of boatmen might have diminished, but the number of cartmen, lascars, smiths, porters, permanent-way staff on the railway, may have absorbed them; there is also 5 per cent. of them in the jute mills. These new occupations have been found for these people; do you not think that there has been a change of occupation?—In Bengal, I have made a careful study of the question. I have been to Santahar and Gualando. There you will find not even 1 per cent. of the coolies are Bengalis; they are Ooriyas, or Biharis, or United Provinces men. The Bengali agriculturist even during the time of famine would prefer to starve at home and die of hunger rather than move on to do that kind of work; he says it is below his dignity or *izzat*.

22898. I would refer you to the Census statement of occupations. If you look at the occupations, you will find that in Northern Bengal, 13 per cent. of the population is engaged in non-agricultural occupations; the proportion rises to 18½ per cent. in Dacca Division and just over 19 per cent. in the Chittagong Division; in Western Bengal it is as much as 26 per cent., and Central Bengal 32 per cent. Surely, those people are not all foreigners?—I know in Dinajpur and in Burdwan they are all what are called Santals, Mundas, etc., they are from the aboriginal stock. A good part of the land of Bengal would remain uncultivated but for the annual immigration of these people to do the work.

22899. You say that the landlords of Bengal stay away from their estates; is that the general practice here?—Those who are well-to-do stay away.

22900. Are there any notable exceptions?—There are a few; I have travelled extensively throughout Bengal.

22901. Take the Maharaja of Burdwan, for instance, does he stay away?—He of course sometimes stays in Burdwan. I know a good many zamindars in Mymensingh, of Muktagacha, Nator, Dubalhat and Balihar, who are living in their own villages. There are notable exceptions even in spite of malaria and *kala-azar*. For instance, the zamindars of Balihar and Dubalhat, I am glad to say, have still clung tenaciously to those places.

22902. Now with regard to the gospel of the spinning wheel. You have already been sufficiently questioned on this subject and I have only one or two points to raise. Is it not a serious matter for any man to direct the attention of 47 million people to one occupation in Bengal? Do you not think that if a man does so, he takes a very heavy responsibility upon himself?—Yes.

22903. You know spinning was an occupation carried on by the women?—Yes.

22904. And the cloth was woven not by the cultivators but by the *Jolas*?—Yes.

22905. If you do not buy foreign or locally-made cloth but have everybody to weave and spin in their own homes, then there is no trouble about the matter, but do you not think trouble will surely arise as soon as you bring the yarn to the weaver? I ask you, has anything happened in the last six years or ten years which has increased the competitive efficiency of the village weaver?—I should say it is increased because when we began some four years ago the yarn was of eight to ten counts and very rough and the weavers refused to have anything to do with it. But, as the yarn improved in quality due to practice, they have now taken kindly to it.

22906. That may be so, but I ask you to consider this matter in the light of what I am going to say. If the Indian weaver is going to compete with the mill-made cloth produced either locally or imported, then he will have to pay particular attention to a number of things such as the value of the raw material. You know what the system is of buying cotton on a large scale by the mills?—I do.

22907. Do they not buy more cheaply than your cultivator?—They buy cheaply because they buy in large quantities.

22908. So that there is an element of weakness there, is there not?—It must go hand in hand with the growing of cotton in those parts of Bengal where the soil is favourable.

22909. I agree with you wholeheartedly there. But my point is this, whether you can give material point to this gospel which you are preaching to the people of Bengal as long as the mill continues to buy at a cheaper rate in large quantities

than the village cultivator? If not, then that is one element in which the mill is always going to beat the cultivator?—Yes.

22910. Take another item, namely, the cost of preparation. As preparation is done on a large scale in a factory, the cost per unit is going to be cheaper there; so, there also your weaver is going to be beaten by the cloth made either locally or imported from abroad?—If that is so, then how is it that there are lakhs of weavers in India who make a living by weaving? This shows that they are able to compete with the mills.

22911. We have not seen the end of the struggle yet. Some countries, I submit to you, have seen the end of this struggle but that struggle is still going on here and we have not yet come to the final stage?—I have read the report of the Director of Industries in Bihar and it says that in spite of the competition with the mills, a good percentage of the weavers manage to eke out a living successfully by means of weaving.

22912. Has that area not been constantly invaded?—Since the days of the " Partition of Bengal " agitation when we all took a *swadeshi* vow, although at that time we could not even make yarn, in Tangail and in many other places the weaving industry received a fillip or direct stimulus and the weavers there are doing very well. I have heard that in some of the markets near Kushtia, I think Kumarkhali, as much as half a lakh of rupees worth of handloom-woven cloth has been sold every week. Take even Howrah Hat, and in this I think Mr. Gupta would be able to bear me out, several lakhs worth of woven cloth is sold every week.

22913 We can only make a guess, but I understand that a good deal of the cloth still comes from the village weavers. But in order that the position may be stabilised and in order that your gospel may spread and be laid on sound economic foundations, I was wondering whether attention was directed to cost matters to which the attention of a mill Director or a mill Manager is always directed. I ask you with regard to the cost of manufacture, is that higher or lower?—I think that shirting cloth is almost competing with the mill-made article but this is not the case with the cloth for *dhotis*. If you have time to pay a visit to our *Khadi* Exhibition which is going on just now, you will see the whole thing in a quarter of an hour.

22914. Would you agree with me that your gospel of the *charka* can spread only if the women folk of the cultivators spin and the cultivators weave themselves, but the moment the weaver comes in, he is at once exposed to the attacks of the mill industry?—If the yarn is of a uniform texture, the weaver has no objection to using it. It is only when it is very rough and unslovenly that the weaver objects to it because it does not pay him.

22915. But if there is any difference between the cost of producing a yarn in a mill on a large scale and the cost of producing a yarn in the handloom, then the side which produces cheaply will win?—My contention is that any extra penny earned during the time which you would have wasted by gossiping or idling would go to compete with imported yarn.

22916. In so far as the extra hour devoted to gossiping was devoted to the spinning of the yarn, there would not be much difficulty, but the difficulty would arise if the yarn were made over to the weaver because then he would be attacked by the mills and other people, and so far nothing has been done to increase the fighting efficiency of the weaver?—Yes.

22917. *Mr. Gupta*: Besides the desirability of finding pasture land for the cattle, are there any other concrete suggestions which you wish to make regarding the improvement of Bengal cattle?—I had thought about the Brahmani bulls in which the Chairman anticipated me.

22918. How are these bulls to be procured? Do you suggest that at Government dairy farms we should have a certain number of bulls which should be distributed?—Yes, that is a very good idea. They may be distributed to the District Boards for the time being.

22919. But the District Board is only one unit. Are there no other agencies through whom these bulls can be distributed profitably? Do you not think Union Boards will be very useful?—Yes; but there is another great drawback. The breeding bulls nowadays are of very stunted growth.

22920. Have you any other concrete suggestions? For instance, if co-operative dairy farms were started, could you recommend that Government should either give them long period loans or give them subsidies?—Yes, I would recommend that; it would be a good thing.

22921. Regarding the provision of subsidiary industries and the revival of the cottage industries, have you any definite suggestions to make by which the district officers can help?—What I have found is that anything done through Government agency turns out in the long run to be rather expensive.

22922. And it is not so popular?—No.

22923. Can you say if Government in any way help you?—My belief is that the initiative must come from the people.

22924. But after the initiative has come, are there any definite ways in which Government can come to your assistance?—Yes, they can help co-operative organisation, advance loans and so forth.

22925. Would you recommend that there should be a Department of Industries in each district to examine the industrial capabilities of the district?—I am afraid the expense of such a department would be almost prohibitive.

22926. You are not in favour of additional expense. How would you like the idea if Government, for instance, desired that the district officer should pay special attention towards developing the industrial resources of the district?—As you know, I am on the Advisory Body of the Department of Industries.

22927. But they have nothing to do with the districts?—It would be a good thing if the district officers could help; but if you have a separate machinery, then the remedy would be worse than the disease.

22928. If it were not too expensive, then some such machinery would be useful?—Yes.

22929. Coming to this question of reviving spinning and weaving; I suppose your main contention is that people should be encouraged to do spinning so far as their own requirements are concerned primarily?—Yes.

22930. As regards competition with manufactured articles, of course, there are some counts in which they can hold their own, both in the lower counts and in the higher counts?—Yes. In higher counts there is no difficulty in competing with mill-made articles. We have now got handspun yarns of 60 and 80 counts and we have some *saris* with fine borders which are purchased at any price by the well-to-do people.

22931. Do you not think it would be desirable if weaving and spinning progressed simultaneously?—Yes.

22932. *Professor Gangulee*: Are you familiar with the agricultural research that is carried on in this country?—I have studied a good deal of what has been done at Pusa in Bihar, and other places.

22933. Having cited some of the experiments made and the value of phosphatic manures and so on, you say on page 366: "I am afraid very little benefit is derived by the illiterate peasantry." What do you precisely suggest there?—What I mean is that the knowledge must filter through to the masses.

22934. You mean to say that that knowledge is not filtering through at the present moment?—Unless you have got a more advanced system of elementary education, it is not possible. The people are very conservative and are wedded to backward notions. It is by the spread of education alone that they can be rendered intelligent and able to understand their own interests.

22935. Could you tell us the acreage which is under improved jute varieties or under improved rice varieties in this Presidency?—I am not aware of it. Mr. Finlow can let you have the figure.

22936. You will admit that a great deal of work has been done in that direction through propaganda?—Yes.

22937. You make a reference to the extension of jute cultivation. Could you tell us what the exact area now is in proportion to the total cultivable area in this Presidency?—I do not know. All that I know is that in East Bengal, Mymensingh, Dacca, and Serajgunj (Pabna) jute has almost supplanted paddy, but not in Barisal and a good part of Faridpur and Khulna.

22938. About 21 million acres are under paddy and about 3 million acres under jute?—Of course, it is a matter of statistics only.

22939. You mention here your experience of Northern Bengal floods and you say you have studied the economic conditions of the villages. Have you published any book?—No; I have been simply watching.

22940. *The Chairman* : What do you say about the standard of the science courses of Indian Universities?—It is pretty high. Our M.Sc. in the Calcutta University would compare favourably with any M.Sc. in England. I have ascertained that copies of our *Journal of the Indian Chemical Society* have been circulated to the Members and if you will kindly have a look at the table of contents, you will find that they are of a fair degree of excellence. In fact they are having abstracts of all these papers regularly appearing in the European Journals of Chemical Societies; there is a constant reference to this and you will find that almost all these are by students of our own colleges, M.Sc.'s and Research Scholars in the College of Science. Thanks to the munificent endowments of the late Sir Taraknath Palit and Sir Rash Behari Ghose, we have got not only endowed Chairs but we have all the special endowments earmarked for research scholarships; these research scholars carry on their researches after taking the M.Sc. degree and go up for Doctorates and their researches are regularly published. Some contribute to the London and Continental Journals but most of them contribute to the *Journal of the Indian Chemical Society*.

(The witness withdrew.)

THE INDIAN TEA ASSOCIATION, CALCUTTA

Replies to the Questionnaire

Introductory.—The tea industry is an important branch of Indian Agriculture, with a capital of over £32,000,000 and supporting an agricultural population of over one and a quarter million, but owing to its capitalistic character and to the organised uniformity of its agricultural processes, the majority of the questions propounded by the Royal Commission do not directly apply to those engaged in the production of tea. It must, however, be borne in mind that a steady increase in the investment of Indian capital in tea is going on, and that Indians in increasing numbers are being employed in this agricultural industry.

The capitalist owners of tea gardens and their managers are not contemplated by the Questionnaire, but as employers of agricultural labour, and as exporters of an agricultural product, they are deeply interested in certain aspects of the Royal Commission's Enquiry. Disabilities which affect a large industry like tea must have a serious effect on the village cultivator too; there are therefore some questions which bring the tea garden owner and the village cultivator together on common ground.

The tea garden employee, as such, does not come within the scope of the Questionnaire, but if he is regarded as a labourer driven by seasonal unemployment to seek temporary service on a tea garden, or as a permanent emigrant who acquires land to cultivate in addition to, or as a sequel to, his employment on a tea estate, he does appear to come within the scope of several of the questions.

QUESTION 1.—RESEARCH.—(*a*) (*i*) The Indian Tea Association have a well-staffed and well-equipped Scientific Department for investigating the various problems connected with tea culture and manufacture (*vide* the accompanying note). It is however realised that there are many fundamental problems connected with agricultural research that hardly come within the province of a specialised department to investigate. Such problems should be investigated by an Institute set apart for such work and not definitely connected with any specific crop or industry. Pusa might be cited as an Institute of this nature but as an Institute for the whole of India it is at present wholly inadequate. It needs very considerable enlarging.

Owing no doubt to financial considerations, some of the Provincial Agricultural Departments are not developing, and indeed are not so well able to deal with their local problems as formerly. This is a very serious matter.

Scientific work in agriculture, which involves many of the natural sciences, needs to be co-ordinated if the greatest progress is to be made. This is not done to any great extent at present. Formerly occasional meetings of various branches were held at Pusa such as the Chemists' and Entomologists' conferences, etc. These enabled the workers in those departments to meet and discuss technical topics, but more than this is wanted, for the workers in all the various branches of science connected with agriculture should be afforded opportunities of meeting together to discuss the various problems and the progress that is being made in their solution by all the branches concerned.

Many workers in agriculture meet together, it is true, at the biennial meeting of the Board of Agriculture, but this does not provide a suitable occasion for the discussion of purely scientific problems.

There is another point that should be stressed in regard to agricultural science. The organisation of the Scientific Department of the Indian Tea Association provides for one controlling head in the Chief Scientific Officer. It is for him to decide what are the problems that are of primary importance, and it rests with him to see that the various branches carry out investigations along such lines and are not allowed to embark on problems that may appear of particular interest to the workers in any one department. Such control, whilst it indicates the problems to be investigated, does not in any way stultify the initiative of those in charge of the various branches.

The work of the various branches is then submitted in the form of reports to the Chief Scientific Officer, who is able to correlate the results and in consultation with the heads of the branches to decide how further progress is to be sought. Some such form of unified control should be enforced in all research institutions. In other words, the encouragement of team work is sought rather than the contribution of any one individual.

(*b*) Many problems can be suggested as requiring investigation, but perhaps those of greatest urgency are :—

1. The correlation of soil analytical data with soil fertility.

2. Investigation into the available plant food in the soil, which subject incorporates the problems connected with soil solution and soil-colloids.

3. Biological problems connected with the plant itself, such as, in what form do nitrogen, potash and phosphoric acid exist in the plant and how does any alteration in these ratios affect the growth and health of the plant and how can alterations be effected.

4. *Soil bacteriology.*—This subject requires a greatly increased amount of work in all its problems, even in one that has received considerable attention, namely, the nitrogen problem.

QUESTION 2.—AGRICULTURAL EDUCATION (vii).—The science courses at the Indian Universities call for much improvement. The standard appears to be too low and the knowledge of men who have obtained honour degrees in Science is so poor that they are not fitted to do more than undertake the simplest forms of routine work. The laboratory skill of the men is lacking. This is to be attributed more to the system of teaching than to the character of the men themselves.

QUESTION 4 (*c*).—(*i*) *The Agricultural Services.*—The demonstration farms conducted by the Agricultural Department are so few, and so far apart, that it is impossible for the small cultivator to visit them to an extent which would make their influence widely felt. There is a very great need for demonstrators to carry out field experiments on the cultivators' own plots. This would bring home to the cultivators the benefits accruing from improved methods.

(*ii*) *Railways and Steamers.*—The tea industry has not been satisfied in the past with the services afforded by the railways, as there has been no progressive policy linking up new districts or providing communications to districts already under tea. The inconvenience thus occasioned has been aggravated by the fact that Government has failed to provide adequate feeder roads. There have, recently, been signs of some improvement as regards railway communications, and a number of branch lines are under construction, but there are still many districts where the requirements of the industry demand fuller railway facilities, as, for example, the north bank of the Brahmaputra in Assam, and the Dooars in Bengal.

(*iii*) *Roads.*—The tea industry is not satisfied with the roads in the tea districts. In fact, road communications in many parts, more especially in the Province of Assam, are in a deplorable condition. The urgent need for the construction of new roads, and the better maintenance of the existing roads, is being continually urged by the Indian Tea Association and its Branch and District Associations. So far their efforts have not met with much success. The Government of Assam has voted a grant for the improvement of communications during the current year, but the amount thus made available can do but little, while some years ago a scheme of road communications was inaugurated by the Government of Bengal in the Dooars, but the work was stopped before it was completed.

The improvement of railway and road communications is also of vital importance to the ordinary cultivator, as it enables him to dispose of his produce to better advantage; he is not then limited to markets in his immediate neighbourhood as he is almost invariably at present.

(*iv*) *The Meteorological Department.*—As recruiters of labour from practically the whole of India, the tea industry, when arranging for its recruiting operations each season, makes great use of the Meteorological Department's statistics and of the District Crop Reports published by Local Governments. The information derived from these sources is sometimes found to be misleading and unreliable, involving the industry in considerable waste of money. In the case of the Meteorological Department's figures, the fault seems to lie in the fact that the observation station for a district is almost always the headquarters town, whether the weather conditions of that town be typical of the whole district or not. The following examples will illustrate what is meant :—

In Bellary and Sambalpur the rainfall at headquarters is less than the average throughout the district whereas at Waltair and Berhampore it is greater.

The District Crop Reports are not always compiled with the care which such important records merit, and are frequently found to be entirely misleading.

As regards the tea districts, the industry is not satisfied with the present meteorological service in the tea districts as it does not record all the data required, *e.g.*, sunshine, and certain stations do not record humidity. From the point of view of the industry these are most important observations.

QUESTIONS 5 AND 6.—FINANCE AND AGRICULTURAL INDEBTEDNESS.—The questions under these headings have no direct application to the tea industry, as garden labour obtains bonuses and is able, where necessary, to get loans from the employer without interest in order to keep them free from debt. The position is

of course different in the case of the ordinary agricultural labourer, and until there is a marked extension of the system of agricultural banks, co-operative credit societies, and similar organisations to replace the moneylender, the development of agriculture will be retarded by the burden of debt which hangs over the petty cultivator.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—The only remedy for the evil results of the fragmentation of holdings is the encouragement of the emigration of those who are in excess of what the land can maintain in reasonable comfort.

QUESTION 10—FERTILISERS.—The tea industry is using larger quantities of artificial fertilisers annually, and it is understood that the cultivator is gradually recognising the benefits to be derived from careful manuring. The extension of the use of fertilisers among the cultivators is likely to be slow; for it is difficult to convince him that the methods handed down for centuries can be improved on, while the lack of funds to meet the cost of fertilisers is a further handicap. The industry can only suggest that Government officials should co-operate with recognised suppliers of fertilisers in bringing home to the cultivator the benefits to be derived from the manuring of impoverished soils. See reply to Question 4 (*c*) (*i*).

(*b*) The tea industry of North India, in conjunction with the fertiliser suppliers, have drawn up a tentative set of rules to control the supply of fertilisers in that they shall conform to the sale standard. Such rules would not be suitable to govern sales to the cultivator and, whereas the tea industry does not press for any legislation at present, it might be necessary in the future to introduce legislation in the interests both of the seller and of the cultivator.

(*c*) and (*d*) In the case of the tea industry, the Scientific Department of the Indian Tea Association can advise as to the most suitable fertilisers for tea gardens, while certain firms which specialise in artificial fertilisers place the advice of their experts at the disposal of purchasers.

The experience of the tea industry in the use of fertilisers shows that there is still room for much useful work to be done amongst ordinary cultivators in encouraging them to adopt systematic manuring. The cultivator in the neighbourhood of tea gardens shows a tendency to profit by the experience of the industry. See reply to Question 4 (*c*) (*i*).

(*e*) Investigations have been and are being made by the Scientific Department of the Indian Tea Association on the effects of manuring with different manures, and the results of the investigations are placed at the disposal of the industry as these are determined from time to time.

(*f*) The labourers employed by the tea industry use very little cowdung as fuel. The discouragement of the practice of so using it by the ordinary cultivator is a matter of education, and it must be expected that progress in this direction will be exceedingly slow. One of the most important methods of convincing the cultivator on this point is by demonstrating its value on his own fields as a means of increasing his crop.

QUESTION 11.—CROPS.—(*iv*) Damage by wild animals is as serious a question to tea gardens which adjoin large forests as it is to the village cultivator. The principal source of such damage in the case of a tea garden is the wild elephant. His depredations take the form of uprooting of tea bushes, destruction of fencing, knocking down coolie huts and eating the rice stored therein, and sometimes the taking of human life. The efforts made by the Forest Department to keep down the numbers of wild elephants are entirely inadequate.

QUESTION 13.—CROP PROTECTION, INTERNAL AND EXTERNAL.—(*i*) As will be noted from the reply to Question 1, the Scientific Department of the Indian Tea Association is investigating and recommending the adoption of various forms of treatment for the control of pests and diseases common to the tea industry.

QUESTION 14.—IMPLEMENTS.—There is a strong demand from the tea industry for the introduction of new and improved agricultural implements, particularly those operated mechanically, but so far no satisfactory mechanical cultivator suitable for work on a tea garden has been devised. Different types of such cultivators are, however, under examination.

QUESTION 18.—AGRICULTURAL LABOUR.—The cultivation of tea, like all other forms of agriculture, employs labour of two kinds :—

(*a*) Temporary labour rendered available by seasonal unemployment; and

(*b*) Permanent settlers.

The tea industry has a recruiting organisation; but Government has none from which the ordinary landlord or cultivator can obtain temporary labourers or

permanent tenants. Even Government itself, in its Public Works, Forest and other Departments, often finds it difficult to get labour.

In India there is, in the more remote areas in particular, great difficulty in would-be employers and would-be employees getting in touch with each other. When they do succeed in getting in touch there are still difficulties to be contended with, such as :—

(1) Legislation of the kind which hampers the operations of tea garden recruiters;

(2) debt which keeps the would-be emigrant in the grasp of the moneylender in his home districts;

(3) agricultural agreements which prevent the labourer from getting away when he wants to.

Government could and should assist the free movement of labour from surplus to deficit localities in the following ways :—

(1) By propaganda and disseminating reliable information; Government need not take up this work itself, but should assist those who desire to do so, so long as they establish their *bona fides*.

(2) By facilitating the operations of approved organisations or individuals for recruiting labour for remunerative employment under conditions favourable to the labourer.

(3) By setting up, where necessary, a Government organisation to arrange for the permanent migration of population to specific localities in cases where private enterprise is not at work.

QUESTION 19.—FORESTS.—(*a*) Certain tracts of land, eminently suitable for tea or other cultivation are reserved as forest,—a much less profitable use of those particular areas.

(*b*) It is unduly difficult and expensive even for those whose land adjoins a forest to obtain any sort of forest produce. The Forest Department should grant permits at nominal rates for the cutting of undergrowth suitable for firewood but not required for timber trees.

In Northern Bengal, much damage has been caused by floods whose violence can in some measure be traced to unregulated cutting of trees in the hills to the north. In sub-montane tracts, like the Dooars, it would be a great boon to all cultivators, whether of rice or the tea bush, if a strip of forest ran along each bank of every stream of any size.

QUESTION 20.—MARKETING.—(*a*) and (*b*) The only factor in this connection on which it is necessary for the tea industry to comment is the question of transport. Where transport is adequate, the industry is satisfied with the marketing facilities, but where transport facilities are not sufficient the industry is not satisfied. This matter has been dealt with already in the answers to Question 4 (*c*), (*ii*) and (*iii*).

(*c*) The tea industry has, through the Indian Tea Cess Committee (see note attached) pressed for the prescription of a standard of quality for tea sold for human consumption in India. As a result of such representations action has already been taken by Local Governments as follows :—

(*i*) The Government of Bengal have prescribed a standard of quality.

(*ii*) The Punjab Government have the subject still under consideration.

(*iii*) In Madras a bill has been introduced in which provisions have been incorporated to prevent the sale of tea of inferior quality.

(*iv*) In Bombay draft rules have been framed and are under consideration.

In Burma and the Central Provinces, the Prevention of Food Adulteration Act has not yet been introduced.

It may be explained that imported foreign teas of inferior quality compete with the lower grades of the Indian product. The industry has pressed for the prescription of a standard of quality for imported tea but the Government of India is of opinion that this is a matter which can be suitably dealt with by Local Governments. With this view the industry disagrees as Local Governments have not the necessary authority and in any case the matter can be dealt with much more easily and economically by the Customs Department. It is not, of course, suggested that any restriction should be placed on the importation of foreign tea beyond requiring that it should comply with the standard prescribed by the Local Government.

QUESTION 21.—TARIFFS AND SEA FREIGHTS.—The tea industry has consistently opposed the export duty on tea, amounting to Rs. 1-8-0 per 100 lbs. Apart from all other considerations, it is contended that this duty is detrimental to the interests of the agricultural classes in India. For it is obvious that every circumstance which

increases the cost price of tea, other than increased wages of labour, reduces the amount which the industry can afford to spend on its labour.

The interests of tea producers are also, of course, affected. Tea is not a monopoly of India and in some of the large consuming countries the export duty places the Indian producer at a disadvantage as compared with his competitor in other countries. In the Australasian market, for example, Java has already a considerable geographical advantage over India and the figures of the imports of tea into Australia and New Zealand are instructive. The figures are given in millions of lbs. :—

	Pre-war average	War average	1920	1922	1923	1924	1925
India ...	9·4	9·3	9·4	6·2	5·8	5·4	7·4
Java ...	3·7	8·1	19·3	23·9	27·1	27·6	24·3

It is not suggested that the export duty on Indian tea is solely responsible for this development, but it is certainly a factor.

QUESTION 23.—GENERAL EDUCATION.—The only comment which the tea industry desires to make under this head is that so far as has been seen the text books supplied in the schools do not seem to touch sufficiently on agricultural matters. These books might be made more use of to spread a certain amount of elementary knowledge of agricultural subjects.

QUESTION 25.—WELFARE OF RURAL POPULATION.—The activities of the department controlled by the Sanitary Commissioner might with advantage be extended and brought into closer touch with the rural population, particularly in regard to such matters as the disposal of corpses, disposal of refuse, draining, elementary hygiene, and so on.

QUESTION 26.—STATISTICS (*a*), (*i*) and (*ii*).—The existing method for obtaining Government's statistics of the production of tea does not always give results which agree with the Indian Tea Association's own figures, and the Indian Tea Association considers that its own figures are the more accurate. The Government's figures are for the most part those reported by planters, estimates being made by the local officers in the case of gardens for which figures are not reported. If there is a discrepancy between the figures returned by the Statistical Department and those compiled by the Indian Tea Association an endeavour is made to find where the discrepancy lies but this is not always possible; definite proof cannot be obtained because the details from which the Statistical Department's figures are compiled cannot be disclosed for the scrutiny of the Association's representatives.

A few years ago the suggestion was made that legislation should be introduced to provide for compulsory returns regarding planting statistics being submitted by planters. The Indian Tea Association's view of the proposal was that, while there did not appear to be any necessity for the suggested legislation so far as the Northern India industry was concerned, it was not disposed to take exception to the suggestion. The proposal for legislation was not, however, proceeded with.

The tea industry would like to see the statistical tables in the " Note on the Production of Tea in India " made available at an earlier date than is now the practice. The publication is not issued until from seven to ten months after the end of the year to which it relates, and a considerable amount of its value, except as a book of reference, is thus discounted.

APPENDIX I

Memorandum on the activities of the Indian Tea Association with particular reference to the work of its Scientific Department

History.—At the annual general meeting of the Indian Tea Association on the 29th May 1899, a resolution was passed authorising the General Committee to make use of the surplus funds of the Association to such extent as they might think fit for the purpose of employing an expert to study scientifically and report upon the cultivation and manufacture of tea. Immediately after that meeting the opinion of the Branches of the Association and the different Planters' Associations in the tea districts were sought regarding the special branches of scientific knowledge in which it was considered that the scientist engaged should be an expert. The preponderance of opinion was distinctly in favour of the appointment of an Agricultural Chemist; and on the recommendation of the then sole chemist to the Royal Agricultural Society in England, Mr. Harold H. Mann, B.Sc., F.I.C., was selected in London and engaged on a three years' agreement. The initial estimated expenditure of this appointment was reckoned at Rs. 1,500 monthly which had to be met from the surplus funds of the Association, augmented by grants from the Government of Bengal and the then Administration of Assam, and from additional contributions from the different Branches of the Association. The initial sanction for laboratory equipment was £200 and this laboratory work was inaugurated in conjunction with the laboratory accommodation in the Economic Court of the Indian Museum, Calcutta, where laboratory accommodation is still enjoyed by this Association. From these small beginnings this Association's Scientific Department has developed into an Institution employing a European qualified staff recruited from home consisting of a chief scientific officer, three chemists, an entomologist, a mycologist and a bacteriologist, together with Indian qualified assistants and others, full particulars of which are contained in the statement referred to in Question 3 below.

Laboratory accommodation.—There are well-fitted chemical, entomological, mycological and bacteriological laboratories, each fitted with petrol gas, water and electricity. The entomological building includes an insectarium and cages in which fully developed tea bushes can be grown.

Laboratory accommodation for the present is sufficient for the staff at present employed.

One chemist with an unqualified assistant is working in a temporary laboratory in a bungalow in the Dooars.

A chemical laboratory is also maintained at the Indian Museum, Calcutta.

Field Experiments.—At Tocklai there are about ten acres of land used for experiments on tea and green crops used in tea.

At Borbhetta, a grant of land situated about 1½ miles from Tocklai, there are over 100 acres of which about 50 have been planted since 1916 with tea for experiment. Over 20 acres of the earlier planted tea are now under experiment.

In addition experiments devised by officers of the department are conducted by managers on their own tea gardens and results reported to and collated at Tocklai.

The present system of recruiting staff.—Recruits for the European staff at this Association's Tocklai Experimental Station, Cinnamara, P. O., Assam, are now engaged by the Indian Tea Association, London, for and on behalf of the Indian Tea Association here in consultation with the Professors of the different Technical Colleges where recruits have been trained. The initial engagement is for a three years' term, with renewals for further periods of three years, in terms of the scale of pay and conditions of service set out in the accompanying print. Formerly it was the practice to engage these officers in the first instance on a five years' agreement but within the past five years initial agreements and renewals have been for terms of three years and these three yearly agreements are found by this Association to be satisfactory.

Lines of research and experimental work undertaken—Chemical Branch.—Research and experimental work have dealt with—

(*a*) *The soil.*—A systematic soil-survey of the tea districts based on an enormous number of soil analyses is in preparation and is nearing completion, surveys of many districts having already been published. Field trials are made on the various soils and results correlated.

In addition to the effect of manures the question of soil acidity and its effect on tea and such green crops as are used in tea has been very carefully studied.

It has been found that tea, unlike most green crops, favours a high degree of soil acidity. The lower limits of acidity are now very fairly understood, but the upper limit requires much further study, as it is complicated by questions affecting disease control.

The use of manures for the tea plant has been investigated with the object of devising systematic schemes of manuring. A great deal of very valuable information has been obtained.

Systematic manuring such as will give best results for expenditure on the particular soil is now very generally practised; but much more information is still required particularly with regard to the quantity of nitrogen which it would pay to apply, and the ratios of potash and phosphoric acid which should accompany larger doses of nitrogen than are now generally employed.

Improved soil treatment accompanied by a greater degree of control of most pests and blights have undoubtedly greatly contributed to the large increase in the tea crop per acre generally obtained throughout the tea districts of North East India since the Department started.

Methods are being elaborated for the rapid estimation of water soluble phosphoric acid and potash in the soil which it is hoped may prove useful in investigating these soil conditions that are favourable or unfavourable for the development of pests and blights on the tea bush.

A large number of experiments in connection with the theory of cultivation are being conducted. Already results have led to economy in the application of deep cultivation. With regard to light cultivation it has been found that the factor of chief importance is that weeds shall be suppressed. This knowledge is of importance in the economical use of labour. Methods of suppressing weeds not involving hoeing have been suggested and tried and are coming into practical use.

(*b*) Questions affecting the pruning, plucking and general field management of tea are also investigated by the Chemical Branch by means of practical experiments. The Entomological and Mycological Branches collaborate in this work as it affects their special interests.

There has undoubtedly been a great improvement in such garden work of late years, and this improvement has undoubtedly been largely fostered by this department.

(*c*) Investigations connected with the production of good quality tea, and with the control of manufacture are also conducted by this branch.

The substances present in tea have been investigated in the laboratory. The nature of the tannin present has received special attention, since this substance and its derivatives formed during manufacture have a great influence on the colour, strength and pungency of the extracted liquors.

Results have emphasised the necessity for a correct wither, and the importance of this is being more widely understood, although its importance has always been appreciated in districts producing good teas. At times climatic conditions are against the production of a good natural wither and methods of artificial withering are now being investigated with great hopes of success.

Results of practical importance have also been obtained by the fixing of optimum temperatures for rolling, fermentation, and firing and the demonstration of the necessity for high humidity conditions during the fermentation have now become very largely a part of the general routine of manufacture.

The fact that the essential oil of tea can be distilled off in steam has made it clear that drying must be done not by heating in moist air, but under a definite forced draught of dry air at low temperature. This fact to some extent is taken into consideration in the construction and use of firing machinery.

Entomological Branch.—The life histories of all the more common and destructive insect pests have been worked out.

For many pests hand collection is still advised as the best method of control, and the time for collection when this method can be most effectively employed has been indicated. A pest calendar has been published.

Cultural methods of control have been indicated in many instances, for example the practice of better pruning for bark-eating borers and cultivation at the right time for pests which pupate in the soil have led to a great diminution in the damage done by these pests.

The application of spray fluids has been shown to be generally of small efficiency in practice. An exception is the very serious pest, red spider, which can be effectively controlled by application of lime-sulphur at intervals varying with the known times required for the hatching of the eggs at different seasons.

The Indian Tea Association.

This Branch has occupied itself mainly with the tea mosquito bug (*helopeltis theivora*).

The aspects of this subject which have been investigated are indicated by the conclusions below :—

(1) While spraying is of distinct value early in the season in checking the development of the insects when confined to isolated bushes here and there, spraying on a large scale is not a practical proposition.

(2) With regard to parasites and predators no specific enemy of the mosquito bug has yet been found which appears to have any effect in causing an appreciable reduction in the numbers of the pest.

(3) With regard to weather it has been shown that conditions which result in continuous wetting of the soil which has received a preliminary soaking conduce to a greater liability to insect attack. It is suggested that this increased liability is associated with a change in soil conditions consequent upon the wetting.

(4) It has been shown that the " jat " (variety) of the bush is of small importance compared with environmental conditions.

(5) The varying effects of shade trees in different places can be explained only by the resulting changes in the soil particularly as regards aeration.

(6) Attention to sub-soil drainage is a prime necessity.

(7) The effect of cultivation on soil aeration is an important factor and the danger of continual cultivation throughout the year under the conditions prevailing in North-East India is great.

(8) With regard to manuring, lime and potash afford evidence of being of benefit, while bushes will respond with an increased crop to well-balanced manuring in spite of being affected by the pest.

(9) There is little justification, so far as increased control by collection of the eggs is concerned, for extra hard plucking on mosquito blighted gardens and no justification for " clean plucking ".

(10) While the operation of pruning affects the insects by removing a great part of the food-supply and by destruction of a certain number of eggs, even cutting to the ground does not prevent the insect from carrying on during the cold weather, nor the invasion of the cut-down area next season.

(11) It has been observed by the Entomologist that there is a correlation of liability to attack by mosquito bug with the ratio of available potash to available phosphoric acid in the soil, and with soil acidity.

Manuring experiment have shown a transient degree of reduction of attack following the application of potash manures.

Leaf analysis has shown that comparative immunity from attack accompanies an increase in the proportion of potash to phosphoric acid in the leaf.

When a constant supply of potash salt in solution is applied directly to the roots of a bush, the potash is taken up by the bush, and bushes which are entirely shut up by the pest can be caused to throw it off entirely.

Experiment with the insect shows that its vitality is directly controlled by the suitability or otherwise of its food-supply. Under field conditions it is observed that apparent immunity does, sometimes, occur naturally.

It is suggested by the Entomologist that high hopes of effective control of the mosquito bug lie in the improvement of soil conditions, and that a chemical enquiry into the behaviour of phosphoric acid and potash in the soil under different conditions might be useful in this direction. It is suggested that the older methods of analysis which show the amounts of substances present in the soil may be described as investigations into soil " Statics ", but that investigation is required into temporary changes in the soil solution which may be described as " Dynamics ".

No effective method for the control of mosquito blight in practice has yet been found, but it is becoming appreciated that losses due to the mosquito bug may be greatly reduced by the maintenance of the bushes in healthy condition, and that increased crops may be obtained, in spite of the presence of mosquito by well-balanced manuring and general good cultural treatment.

Mycological Branch.—Shortly after the opening of this Branch of the department at the end of 1911, it was found that root diseases were causing very serious losses in all districts. In the case of the Dooars it was estimated that the loss was sufficiently to justify an expenditure of Rs. 60 per acre on new clearances in preventing root disease. The losses due to these diseases have now been very much reduced throughout North-East India. Many gardens formerly badly infected are now comparatively free.

The Indian Tea Association.

In regard to blister blight (*Exobasidium vexans, Massee*) as a result of our investigations it has been found possible to eradicate or greatly reduce the incidence of the disease on isolated gardens, but in Darjeeling where gardens are adjoining it has not been found possible. Even in the case of Darjeeling prompt treatment of small outbreaks and the protection of tea which experience has shown to be specially susceptible to the disease has considerably reduced the losses due to this disease.

Other leaf diseases such as Brown blight (*Glomerella cingulata*), Grey blight (*Pestalozzia theae*) and Copper blight (*Laestadia camelliae*) have been investigated. It has been found that soil conditions are largely responsible for outbreaks of these diseases. Red rust (*Cephaleuros virescens*) has also been found to be controllable by soil treatment. Severe outbreaks of these diseases are now no longer feared.

Stem disease producing fungi have also been investigated and it has been found that most of these diseases are associated with unsatisfactory system of pruning. Improvement in pruning methods is reducing the amount of these diseases.

The general line of investigation has been to ascertain the influence of health and vigour of the tea bushes on their susceptibility to disease. Specific fungicidal measures have been confined to the treatment of small outbreaks of disease with a view to eradicating the fungi concerned before they attack large areas. When large areas have become infected, the first consideration has been the improvement of the health and vigour of the bushes concerned. In most cases this leads to such a reduction in disease that specific fungicidal treatment becomes unnecessary. The investigations on fungus disease have done much to improve the general condition of the tea.

In the course of our investigations on the treatment of fungus diseases it was found that lime-sulphur solution applied in the cold weather after pruning not only reduced the amount of fungus disease directly but also indirectly caused an improvement in the health of the tea. This solution is now being used on a large scale with very beneficial results.

In addition to the work on fungus diseases, the Mycologist has devoted much attention to the physiological aspects involved in the manufacture of tea. He has succeeded in isolating many varieties of yeast from both fermenting tea leaf and from the surfaces of fresh leaves. He has also demonstrated that some of these yeasts influence the flavour of manufactured tea. The influence of temperature on the changes in colour of tea leaves was also investigated by this Branch and useful results obtained.

In the absence of a Botanist, most questions involving special botanical knowledge are referred to this Branch. In this connection a herbarium has been gradually built up. It now contains some 3,000 species. The Branch has paid attention to the improvement of tea seed gardens and it has been possible to make some useful practical suggestions as a result. In former years this section also devoted a great deal of attention to green manures and shade trees and most of the experiments carried out with new varieties of green manures were initiated and supervised by the Mycologist.

The microscopic examination of tea seeds for export certificates is also carried out by the Entomological and Mycological Branches and in the past year more than 60,000 tea seeds were examined in this connection.

Bacteriological Branch.—This Branch has only been in existence for seven months. Research is at present directed towards the problems connected with nitrification in acid tea soils, and up to the present time work has been confined to the study of the chief factors which influence this process. In the case of ammonium sulphate, initial acidity of the soil plays an important part and it has been found difficult to start nitrification of this salt in a soil of high hydrogen ion concentration. In the case of oil-cake the hydrogen ion concentration of the soil in the immediate neighbourhood of any particle is raised by the liberation of ammonia, and nitrification proceeds rapidly.

The results of the experimental work of the department as outlined above are given practical application generally throughout the tea districts of North-East India. The appreciation of the work of the department is evident in the increasing demands received from those interested in the tea estates for advice and assistance from the department.

Advisory work done for provincial departments, local bodies, etc.—Advisory work with regard to tea is not asked for by provincial departments or local bodies.

Information acquired is communicated in the *Indian Tea Association Quarterly Journal* in a practical form as free from scientific technicalities as possible

Planters and managing agents ask and receive advice by post.

The Indian Tea Association.

In addition, the officers of the department tour all the tea districts regularly and visit the gardens which ask for visits for the purpose of discussing problems. Lectures are given at the local clubs or other meeting places. These are very well attended by the planters.

Provision for training men for the highest posts.—No special provision is made for training men for the highest posts, since candidates for these posts are selected from British-trained men. The qualified and unqualified assistants receive a very useful training in agricultural science, and sometimes leave to take up superior posts. The training given meets our requirements. It is found that even the Honours Science degree conferred by an Indian University denotes but a very indifferent knowledge.

Short courses in special branches of study.—In the cold weather months of every year arrangements are made at the Association's Tocklai Experimental Station for three courses of instruction for Superintendents, Managers and Assistants attached to tea estates in the membership of this Association. Each course accommodates twenty visitors and lasts for one week, thereby allowing for instruction to be imparted to sixty visitors every cold weather. The subjects dealt with in these courses of instruction will be seen in the accompanying syllabus prepared by the Chief Scientific Officer.

Co-operation in work.—(*a*) With the Imperial and Provincial Departments of Agriculture;

(*b*) with other departments;

(*c*) with the Imperial Bureau of Mycology and Imperial Bureau of Entomology; and

(*d*) with other institutions such as the International Institute of Agriculture at Rome.

In the work of the Scientific Department, Indian Tea Association, all branches co-operate under the direction of the Chief Scientific Officer of the department.

As instance the Chemical Branch endeavours to find the information regarding soils required by the Entomological and Mycological Branches in relation to attacks by pests and blights. The Chemical Branch has collaborated with the Bacteriological Branch in connection with the investigation connected with the determination of soil acidity.

The Entomological and Mycological Branches have worked together on the examination of tea seed for export.

(*b*) This department has always received able and willing help from the Imperial and Provincial Departments of Agriculture when required; and has been willing to render any service possible in return.

Opportunities for meeting and discussion at conferences at Pusa have been taken but it is regretted that these conferences are not held sufficiently regularly and frequently.

(*c*) The Imperial Bureaux of Mycology and Entomology have been useful.

(*d*) The publications of the International Institute of Agriculture and of other research institutions in other countries are helpful, but these institutions are not consulted directly, except during visits whilst officers are on long leave.

Obstacles in the work.—The chief obstacle in the way of developing the work of the department is the difficulty of applying results obtained at Tocklai to districts different in soil, climate, etc. In the neighbourhood of Tocklai also certain pests such as helopeltis and thrips are practically absent. At present this difficulty is only partially solved by observation and experiment during tours and by experiments on gardens run by managers themselves. Such experiments are always very difficult to interpret because owing to the demand on labour and on supervision it is never possible to run experiments on more than single plots, the results of which are liable to a large and indeterminable probable error. This obstacle can only be overcome by the establishment of small branch experiment stations in the various districts. As a start to this end there is now an officer of the department stationed in the Bengal Dooars, with a temporary laboratory, who is also to give personal supervision to experiments on the gardens in the neighbourhood.

The Dooars, however, and also the Terai and South Sylhet, have expressed wishes for permanent Branch Stations to be established within their districts, and it is hoped that these will eventually materialise, and that when the benefit is seen, other districts will follow the example.

Total budget provision.—The expenditure of the Association's Scientific Department on revenue account in 1926 is estimated at Rs. 2,88,726-1-0 which is reduced by the estimated income to Rs. 1,93,937-1-0 which is met from the money collected in subscriptions at the rate of 8 annas per acre from all tea companies in the membership of this Association. The estimated capital expenditure in 1926 is Rs. 45,511-4-0.

The Indian Tea Association.

APPENDIX II

Memorandum on the Indian Tea Cess Committee

The Indian Tea Cess Committee was constituted under the provisions of Act IX of 1903 which was passed by the Governor General of India in Council on the 20th March 1903. The object of the Act was to provide for the creation of a fund to be expended for the promotion of the interests of the Indian tea industry. From the year 1893 the Indian Tea Association had been collecting a voluntary assessment for expenditure on the development of foreign markets for Indian tea. There are, however, objections to this system of raising funds, and, these becoming increasingly obvious as time went on, the Association resolved to obtain if possible the levy of a compulsory cess. And in 1902 after much correspondence and discussion the General Committee of the Association presented to the Viceroy a memorial, praying for the imposition of a cess at the rate of one-fourth of a pie per pound on all tea exported. The memorial was signed by, or on behalf of, 366 tea proprietors and companies, representing 416,140 acres of tea land, or rather more than 80 per cent. of the total area then under tea cultivation in India. It was favourably received by Lord Curzon, and a Bill, providing for the levy of the cess at the rate suggested, was introduced into the Imperial Legislative Council by Sir Montague Turner, the then Mercantile Member, on the 30th January 1903.

2. Before the passing of the Act the General Committee of the Indian Tea Association had framed, at the instance of the Government, a scheme for the administration of the funds which would be raised. Subject to certain modifications this scheme was adopted by the Government. In its final shape it provided for the formation of an Administrative Committee consisting of twenty members representing (*a*) tea growers; and (*b*) the general commercial community. The representatives of the latter were to be four in number, three of them were to be nominated by the Bengal Chamber of Commerce, and one by the Madras Chamber of Commerce. The representatives of tea growers were to be nominated by the following associations :—Indian Tea Association, Calcutta (seven); Assam Branch, Indian Tea Association (two); Surma Valley Branch, Indian Tea Association (two); Darjeeling Planters Association and Terai Planters Association, jointly (one); Dooars Planters Association (one); Dehra Dun Planters Association (one); Kangra Valley Planters Association (one); United Planters Association of Southern India (one).

3. As is intimated above, the cess was levied at the rate of $\frac{1}{4}$ pie per lb. of tea exported. It remained at this rate until 1921-22 when, at the instance of the tea industry, the rate was raised to 4 as. per 100 lbs. In 1923-24 the Act was amended, also at the instance of the tea industry, so as to enable the cess to be levied at a maximum rate of 8 as. per 100 lbs. of tea exported. The maximum rate has not been put into operation so far. But, with effect from the year 1923-24, the levy has been made at the rate of 6 as. per 100 lbs. of tea exported.

4. The cess is collected by the Customs Department and the proceeds are made over by the department to the Committee. The collections from 1903-04 to 1925-26 are shown in the following table :—

		Rs.
1903-04	at $\frac{1}{4}$ pie per lb.	2,66,894
1904-05	,,	2,75,490
1905-06	,,	2,76,762
1906-07	,,	3,04,753
1907-08	,,	2,94,482
1908-09	,,	3,02,095
1909-10	,,	3,23,794
1910-11	,,	3,31,253
1911-12	,,	2,37,414
1912-13	,,	3,61,727
1913-14	,,	3,75,616
1914-15	,,	3,89,235
1915-16	,,	4,36,256
1916-17	,,	3,81,662
1917-18	,,	4,59,863
1918-19	,,	4,31,687
1919-20	,,	4,87,108
1920-21	,,	3,66,439

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		Rs.
1921-22	4 annas per 100 lbs.	... 7,44,334
1922-23	,, ...	... 7,28,052
1923-24	6 annas per 100 lbs. ...	... 12,66,123
1924-25	,,	... 12,83,392
1925-26	,, ...	... 12,28,526

5. At the time when the cess was instituted the Committee determined to concentrate their efforts largely on the United States of America. With this end in view they spent Rs. 23,61,334 in promoting the sale of Indian tea in that country from the year 1903-04 to the year 1916-17. By that time the War had made it difficult to proceed. Freight troubles grew more and more serious, and the reduced imports of tea into the United States made advertising unnecessary. The work was accordingly restricted, so much so that in the years 1917-18 to 1922-23 a sum of only Rs. 83,363 was spent. The Committee began again in the United States in 1923-24 after making full enquiries into the trade conditions prevailing there. They decided to embark on a scheme of intensive newspaper advertising, and this scheme they placed in the hands of Messrs. C. F. Higham, Ltd., advertising agents of London and New York, by whom it is now being carried out. During the years 1923-24, 1924-25 and 1925-26 the Committee have spent Rs. 13,87,008 in the United States.

6. In continental Europe, the Committee began work in a small way in 1905-06. They selected Belgium and Germany as two countries in which to start their propaganda in favour of China tea. The operations came to an end in 1916-17 the distributing trade. The scheme went steadily forward until it was stopped by the outbreak of War in 1914. Apart from gifts of tea to the French and American troops nothing further was done on the Continent until 1922-23 when work was begun in France and from that time to the end of 1925-26 a sum of rather more than Rs. 9¼ lakhs has been spent in France. The total amount expended on the Continent of Europe since 1905-06 is slightly in excess of Rs. 19¾ lakhs.

7. In the United Kingdom, the Committee carried on an advertising scheme for a number of years before the War, the object at the beginning being to counter a propaganda in favour of China tea. The operations came to an end in 1916-17 by reason of the War. In the early years of the cess, 1903-04 to 1906-07, the Committee contributed to a League which was formed with the object of bringing about a reduction in the import duty on tea in the United Kingdom. They have also been represented at exhibitions such as, for example, the British Empire Exhibition of 1924. In all they have expended about Rs. 7¼ lakhs in the United Kingdom since the institution of the cess in 1903.

8. During the years 1903-04 to 1914-15, the Committee spent small sums in India on experimental operations, the total amount being less than Rs. 75,000. But during the War they decided to begin work in India on a large scale, and in the eleven years 1915-16 to 1925-26 they have expended upwards of Rs. 41 lakhs in this country. No trading in tea has been undertaken by the Committee. The funds have been spent in encouraging the sale of tea entirely by private enterprise. More than 40,000 bazar shopkeepers have been influenced to take up the sale of tea, and have been assisted with free supplies of suitable advertising matter, containers, measures, and packets for tea. Various attractions have also been periodically lent in order to bring customers to the shops. Arrangements for the sale of tea to Indian passengers have been organised on several inland steamers, and at important junctions and large stations on the Eastern Bengal, East Indian, Oudh and Rohilkhand, North Western, and Bombay, Baroda and Central India, and South Indian Railways. At the instance of the Committee, tea rooms have been started at most large industrial establishments in India where such did not previously exist. Tea and Recreation Rooms have been organised for about 300 military units.

9. According to the statistics available, the sale of tea in India and Burma averages approximately 18 million lbs. annually for the quinquennium before the start of the propaganda work in India. During the year ended 31st March 1926, the estimated quantity of tea available for consumption in India and Burma was over 50 million lbs.

Mr. T. C. CRAWFORD (Chairman), Mr. P. H. CARPENTER and Mr. J. A. MILLIGAN, Representatives of the Indian Tea Association

Oral Evidence

22941. *The Chairman*: Mr. Crawford, Mr. Carpenter and Mr. Milligan, do any of you gentlemen desire to make a statement of a general character before we proceed to question and answer?—(*Mr. Crawford*) No, I think we have made our statement clear; we would rather just answer questions.

22942. I propose to address myself in the main to you, Mr. Crawford, but of course if your colleagues desire to interpolate any remarks, we shall be glad to hear them; if they do not, we shall assume that in the main they agree with your expressions of opinion. Will you turn to the memorandum which your Association has been good enough to prepare for the Commission and for which we are greatly obliged. There is a covering sheet giving us the history and the particulars of organisation of the Indian Tea Cess Committee; I should like you to tell us at the outset what exactly is the relation between the Indian Tea Cess Committee and the Indian Tea Association?—The Tea Cess Committee was started through the Indian Tea Association to propagate and assist in advertising the sale of tea. We have no real connection now with the Indian Tea Association except that the Indian Tea Association nominates certain representatives to the Tea Cess Committee.

22943. Let me understand the position aright; your Tea Cess Committee is concerned purely with advertisement?—Purely with advertisement, yes.

22944. How is your Indian Tea Association financed?—It is financed by a levy from members of eight annas per acre per member.

22945. The Indian Tea Association is financed on an acreage basis, while the Indian Tea Cess Committee is financed on a poundage cess?—Yes.

22946. Could you provide the Commission with some indication as to the extent to which demand has responded to advertisement?—In India, where we have been mainly concerned, about ten years ago the consumption of tea was approximately 16 million lbs., while we now place the consumption of tea in India at 50 million lbs.

22947. And overseas?—In America it is really too early to say what results have been obtained. We are spending in the neighbourhood of £50,000 in America; we consider it will be a matter of three or four years before we can clearly state what results will be obtained.

22948. How long after the launching of an effort, do you find the reaction usually takes place?—We could not say from experience. In India, the position is rather different because we have concerned ourselves mainly with work in the larger towns and on railways; certainly the response has been slow but it has been quite marked; annually the increase has been quite marked. In regard to America we have noticed a slight response and there has been a demand for Indian tea; it is difficult to say to what extent that has been due to our advertising campaign which only started two years ago.

22949. Now will you turn to the principal memorandum of the Indian Tea Association? In the first paragraph on page 386 you point to the fact that there is a steady increase in the investment of Indian capital in tea. Is it the practice for Indians to take the whole risk and to manage themselves?—Yes, particularly in the Dooars there is a marked increase in the acreage taken up by Indians both for the cultivation and manufacture of tea.

22950. What do you say about the standard of cultivation in plantations managed by Indians as compared with plantations managed by Europeans?—I think the majority of advanced Indians follow European methods of cultivation; they profit by European methods of cultivation.

22951. *Professor Gangulee*: What about the quality of tea?—That is rather a difficult question to answer. Possibly on the whole, with many more years of experience, our manufacture is a bit better than the Indian. At the same time, a great deal depends on the district in which it is grown and various other factors. There are some Indian gardens producing excellent tea.

22952. *The Chairman*: And no doubt the market which they are seeking to serve has to be taken into consideration?—Yes.

22953. Will you turn to page 386? To what extent are you on the research side of your organisation in touch with the Government of India organisation at Pusa?—(*Mr. Carpenter*) We have no organised link; it is purely as we feel we need it.

22954. Let me make myself clear; the first problem which you suggest as requiring investigation is "The correlation of soil analytical data with soil fertility." Now that is a fundamental problem of general application?—Yes, it is.

22955. Is not that a problem to which Pusa might well direct its attention?—Yes, I think it is; that is why I mention it here.

22956. Have you asked them to do so?—No, never definitely. I have never been consulted as to what programme Pusa should adopt.

22957. You feel disinclined to take the initiative?—Yes, in that respect officially.

22958. Would you like to have closer touch with Pusa if it can be arranged?—I certainly should in things like that.

22959. Then on page 387 under the heading Agricultural Education, in answer to our Question 2, you say, "The science courses at the Indian Universities call for much improvement." On what do you base that view?—On my experience of the graduates turned out from Universities; we employ them.

22960. Do you think they are weak in pure science?—Yes, and in technique particularly.

22961. In what branch of technique; research technique?—No, ordinary laboratory technique, in chemistry, bacteriology and mycological work.

22962. What is your own training?—I am a chemist.

22963. Have you ever held a post under the Government of India or any Provincial Government?—No.

22964. What do you say about the natural capacity of Indian youths under adequate systems of training? Do you think their lack of scientific attainment which you think you see might be removed?—I am only speaking directly from my own experience; judging from my own experience, I should say that some of the men that I have had could certainly have been trained.

22965. They are first class men?—I consider that one or two of them have been capable of becoming first class men. I do not think that of all of them.

22966. You are concerned with an organisation which looks at these matters from the commercial angle and your views are very important. I do not know whether you could give the Commission any more substance upon which we might form a judgment on the views that you have expressed as to the inadequacy of scientific training in the Universities?—It struck me that one of the great needs of the students was lack of technique which means that they had not had sufficient laboratory training during their College course. I have not gone into the detail of what that course is, that is for the University authorities, but in my opinion they ought to have more practical training.

22967. Have you ever made any representations to any person or body responsible for the University courses?—No, I have not.

22968. You recognise the importance of keeping the authorities who are responsible for controlling these matters at the Universities in touch with commercial opinion, because after all the main objective in the minds of most of the young men when they take these degrees is remunerative employment?—I quite agree; I am quite willing to give my views to the Universities whenever they want them.

22969. *Professor Gangulee*: Have you visited any research laboratories run by the Universities?—No, I am speaking purely from my own experience gained in my own laboratory.

22970. *The Chairman*: I do not want to put words into your mouth but has there been too much work on the text-books and too little work at the bench?—Yes, some of the men have obviously got text-book knowledge.

22971. Good general text-book knowledge?—Yes, without having had sufficient practice.

22972. Not sufficient practice in the laboratory?—Nor have they had sufficient training in initiative, that is to say, I think they have had very little training in the problems; they have not been given a problem that has required anything more than text-book knowledge and asked to solve it.

22973. I will leave that subject. Under the heading Railways and Steamers on page 387 you say " The tea industry has not been satisfied in the past with the services afforded by the railways, as there has been no progressive policy linking up new districts or providing communications to districts already under tea ". Now is it your view that there are openings for branch and feeder lines which would be remunerative and which are not being taken up?—(*Mr. Crawford.*) At the present time so far as the tea districts of Assam are concerned, we have three feeder lines under construction; at the present moment we are agitating for another feeder line to deal with a very large area of tea and cultivators' land. In addition to that we are agitating for a link with the Bengal Dooars Railway and the Eastern Bengal Railway; but generally we feel that in the past the possibilities have not been sufficiently exploited. There is certainly now every indication that the Government are alive to the need for opening up and undertaking new areas; and with that, if the present programme is continued, we have no complaint to make.

22974. What gauge are you on?—It is a question of fitting in with the gauge available. As the Assam-Bengal Railway is on a metre gauge, it would not serve any good purpose to put in other gauge in Assam.

22975. There is no difficulty in connection with the gauge?—No.

22976. On the same page you say you are not satisfied with the service rendered by the Meteorological Department because, as you say, the information they give is sometimes found to be misleading and unreliable, involving the industry in considerable waste of money. I read between the lines there that you are referring to attempts on your part to direct your recruiting agencies in accordance with unemployment in other rural areas in India?—Yes.

22977. You want to know where crops are going to fail so that you may keep your recruiting staff at work and get the necessary labour for your own plantation; is that right?—Yes.

22978. Then on the same page again you say you are not satisfied with the present Meteorological Service in the tea districts. There you are concerned with forecasts of weather, records of sunshine and other natural facts as a guide to the current season or future weather?—Yes.

22979. Then on page 388, in answer to our Question 10, paragraphs (*c*) and (*d*) you say, " The cultivator in the neighbourhood of tea gardens shows a tendency to profit by the experience of the industry." Do you mean other cultivators of tea?—No, I mean the actual land cultivator.

22980. Do you think the presence of the tea gardens and the consequent large local demand for fertilisers cheapen the fertilisers and make them more easily available for the other cultivators?—It is not that; for instance, we make a point of collecting as much cattle manure as we can and we now find other cultivators realising its manurial properties are anxious to acquire it for application on their own paddy fields. There is also, I think, a slight tendency to use chemical manures.

22981. On the same page you speak of the damage to tea gardens by wild elephants?—That has been very serious of late.

22982. Is it only a question of having a sufficiently well organised hunt?—We are not allowed to kill them unless they are proscribed.

22983. Are only rogues proscribed?—If they do a fair amount of damage, Government may proscribe them.

22984. Is it not the case that a *kheddah* is being organised there at the moment?—Only in certain districts.

22985. Is it a serious source of loss?—It has been particularly so in the last month or so, but it has always been a serious matter.

22986. You deal with the general question of agricultural labour and your views are set out perfectly plainly. Amongst the difficulties that you encounter in recruiting sufficient labour from distant districts, does not the cultivator's love of his own native village play an important part?—There is no doubt that it does.

22987. Are you experiencing a growing difficulty in getting sufficient labour?—Yes.

22988. Is that because you want more labour or because less labour is available?—There is less labour available because there are many other forms of industry developing in India which absorb labour. Railway construction in particular and

docks and wharves have absorbed a certain amount of labour which previously went to the tea plantations; moreover there has been an extension of tea cultivation which absorbs more labour.

22989. Do you want labour to come and settle in the neighbourhood?—We prefer permanently-settled labour; we prefer families to come. Afterwards they either take land on the estate or take up Government land.

22990. Do you provide houses for them?—Yes and medical attendance.

22991. You have a very complete system of hygiene, have you not?—We are doing our best, but we are kept back very much by the peculiarities of the labourer.

22992. You mean his disinclination to adopt modern views of hygiene?—Yes.

22993. Is it not true that you are conducting an anti-hook-worm campaign?—I could not call it a campaign but the treatment of hook-worm is receiving special attention. We have also conducted a malaria survey of Assam and have just finished a survey in the Dooars.

22994. All at your own expense?—Yes.

22995. Have you seen definite indications of improved vitality and capacity for work as the result of the hook-worm campaign?—Certainly. As the result of the hook-worm campaign we find there is increased efficiency which is a great factor.

22996. Is there a greater degree of mental alertness?—Yes.

22997. Is that very definite?—In Darjeeling in particular we carried out a very extensive and elaborate campaign and we found as a result of that that the efficiency was increased by, I think, about 15 per cent.

22998. Was the central point of that campaign the provision of sanitary latrines?—We have managed to do that in Darjeeling; in other districts it is very difficult to get sanitary latrines used when installed.

22999. Is there any hope of permanently eradicating hook-worm until you can control sanitation in that respect?—I do not think so; I think we are certainly keeping it down.

23000. But until you can get the latrine system installed throughout, there will always be infection?—Yes. We are quite prepared to instal latrines if there are any signs of their being used.

23001. It is a great deal easier for your Association to control these matters amongst labourers in your employ than it would be for the Government to control these matters in villages where the cultivators are independent. Have you instances where you have been successful in persuading the community itself to administer and keep these facilities reasonably clean?—Our efforts have been mainly in the direction of improving our own house.

23002. I am speaking of your own house?—In our own house, yes; it is very slow but we are gradually effecting improvement in matters of hygiene and in regard to sanitation particularly. The lines are being kept in better order and we are looking forward to improving matters further. We find that they are more inclined to benefit by medical advice than they were a few years ago.

23003. Do you have overseers or foremen in charge of the sanitary side of the work?—No; we work on the principle of having an European Medical Officer in charge of a group of Indian doctors each of whom is in charge of an estate hospital or dispensary. The Indian doctor is usually made responsible with his hospital staff for keeping the lines clean and with regard to sanitation.

23004. As a rule how many families would be in charge of each Indian doctor?—An estate varies from about 400 to 800 acres.

23005. Employing how many people?—About 1,200 in the case of the latter.

23006. Is that male workers?—Families all told.

23007. Does that 1,200 include the children?—Yes.

23008. Even in the conditions where one trained doctor, with I suppose adequate assistance, is in charge of that small number of people, do you find the greatest difficulty in controlling these insanitary practices?—Yes.

23009. *Professor Gangulee*: What is the qualification of the Indian doctor?—As a rule we prefer to have graduates from one of the recognised Colleges or Medical Schools.

23010. *The Chairman* : They are fully qualified men, are they not?—In some cases they are not as well qualified as we should like them to be; but we are very much limited by what is available.

23011. Do you mean by what you are prepared to pay or by what is available?—I do not think we ever questioned any payment in regard to medical services.

23012. Are they disinclined to come?—They seem to be disinclined to go to Assam.

23013. What do you think that is due to?—Possibly it is due to the malaria.

23014. *Professor Gangulee* : What pay do they get now?—I could not say; it varies; I know some of the Indian doctors get Rs. 300, others Rs. 100 to Rs. 150.

23015. *Rai Bahadur Bannerji* : In that case are not they graduates from the Calcutta Medical College?—They are mostly obtained up-country; we leave it to the European doctor to recruit the Indian doctors himself.

23016. *The Chairman* : In answer to Question 19 with regard to forests you say, " Certain tracts of land, eminently suitable for tea or other cultivation, are reserved as forest,—a much less profitable use of those particular areas." Do you mean less profitable to your constituents or less profitable to the Government?—Less profitable to the Government.

23017. Are they tracts which are being held for commercial reasons or for protective reasons?—Forest reserves entirely.

23018. It is not a question of preserving them as areas which ought not to be cut out because of the dangers by erosion of flood?—No.

23019. Have you ever made representations to Government on that score?—Continuous representation is being made for releasing these areas, but it is always refused.

23020. With an argument or without?—(*Mr. Milligan.*) Argument has been sometimes attempted without much success. The only possible argument of course is that the land would be more profitable if put under tea than under forest; that does not appeal much to the Forestry Department.

23021. *Mr. Calvert* : Do you mean more profitable to the Government?—Yes.

23022. *The Chairman* : Do you mean that the Forest Department have water-tight minds in that respect?—Entirely.

23023. They are thinking of their own budget?—It is a very difficult thing to get the Forest Department to part with a single acre of land; it always has been. They are only too ready to grab any land they can get, for increasing the reserves.

23024. But do you as an organisation deal with Government in these matters or do you allow the individual to make his own application?—(*Mr. Crawford.*) As a rule, with regard to land application the individual appeals to Government.

23025. Could you not as an organisation bring your weight to bear in a matter of this sort?—I do not remember it having been taken up by the Association at any time.

23026. Do you not think it might well be?—Possibly.

23027. On page 389 you deal with the question of marketing; you say, " The industry has pressed for the prescription of a standard of quality for imported tea, but the Government of India are of opinion that this is a matter which can be suitably dealt with by Local Governments ". Is that with the idea of keeping out teas which are cheaper than the lowest priced Indian tea?—No, because there is a duty on imported tea; it is entirely with a view to setting up and maintaining a suitable standard of tea for India. We find it extremely difficult to prevent unsuitable tea from coming into the market. We have been agitating it through the various Governments to have a standard of tea prescribed, as is prescribed in most other countries in the world. The Government of India think that is entirely a matter for the Provincial Governments, but on the other hand it is easier to deal with imported tea through the Customs which is a Central Department than through the Provincial Governments. That is the reason why we mention that aspect particularly there.

23028. Who do you think is the best judge of good tea; your Association or the person who is going to drink the tea?—I think the Association.

23029. But you are quite definitely of opinion that these imported teas are not being sold more cheaply to the public than tea which could be provided from Indian gardens?—That really does not trouble us. Recently there has been some particularly undesirable stuff coming in from China; we want to keep that off the

market, and we also want to keep off the market certain low grade stuff sold by Indian producers, in other words, tea waste which we export and which should be used for the manufacture of caffeine.

23030. On the same page you say, " The tea industry has consistently opposed the export duty on tea, amounting to Rs. 1-8-0 per 100 pounds." I suppose the effect of that duty is certainly not to raise the price of tea to the Indian consumer, is it?—No.

23031. Has it any effect in lowering the price to the Indian consumer?—I do not think the consumption of tea in India is sufficiently high to have a marked effect one way or the other.

23032. If it did have an effect, that is the effect it would have, would it not?—I should not like to say; I do not think it has any effect on Indian prices.

23033. Does your Association still hold the view set out on page 390 of your memorandum that legislation might be introduced to provide for compulsory returns regarding planting statistics being submitted by planters?—Yes. We did not hold any very pronounced views about it; certainly the figures were unreliable and we were quite prepared at that time to entertain any proposal as to legislation.

23034. Is there a large area outside your membership?—Our membership represents 83·46 per cent. of North India and 71·8 per cent. of all India. In addition to that, of course our branch associations frequently have members who are not members of the parent association, so that I think possibly you may take it we really represent about 90 per cent. of North India.

23035. Do you know what particular importance was attached by its advocates to this particular scheme?—That is in regard to collection of facts about acreage?

23036. Yes?—It is useful from our point of view; we are very anxious indeed to know what is available for consumption in India particularly; that is what we were getting at.

23037. Would these facts about the acreage planted be essential for the provision of the information which you require? I was trying to get from you what was in the minds of the persons who advocated the collection of facts about acreage?—The reason was that we were out in our estimate; our estimate differed considerably from the Government's estimate. After going into the matter further we found that the Government had left out two or three gardens in one district. This agitation followed on that. We considered if there was an exchange of figures between our Association and Government, we could possibly trace where these differences arose. On the other hand, Government considered their statistics confidential.

23038. Is the whole of your membership in one Province?—No, Assam, Bengal, etc. We do not touch South India.

23039. In your research work do you find any difficulty springing from the fact that your constituent's gardens are situated in more than one Province?—Mr. Carpenter does; he is very anxious to have branch research stations throughout the various districts.

23040. I think we should like to hear about that?—(*Mr. Carpenter.*) The climatic and other conditions, in the tea districts vary very considerably, from conditions such as one gets in Ranchi and Dehra Dun to conditions such as one gets in Northern Bengal. There are also very great differences of soil. It is impossible to translate the results of experiments carried out in one district to other districts; they have to be confirmed in the particular districts for which one wants results. The experimental station at present is situated on a sandy soil in Assam. It represents a very large area of Assam proper. It is entirely different from a very common type of soil that occurs in Northern Bengal where there is a heavy clay. The result is that one finds that results from manuring in one place will not hold good in the other. Owing to different weather conditions one also experiences different incidence of blights which require to be studied on the spot.

23041. Would you advocate one central institution and then smaller institutions in typical areas?—Yes. You are speaking of tea?

23042. Yes, tea only?—Yes, I do. I consider we ought to have one central institution where we could deal with general matters, and that the results so obtained should be interpreted for other districts by small district stations. I do

not suggest having big staffs in the districts, but small staffs which would be in continual touch with the planters of that particular district.

23043. Have you any touch with the Government; is any representative of Government in touch with your Research Committee?—(*Mr. Crawford.*) We have a Scientific Branch Committee.

23044. Have you any Government representative on that Committee?—No.

23045. Are you familiar with the organisation of the Indian Central Cotton Committee?—No.

23046. Are you familiar with it, Mr. Carpenter?—No, I am not.

23047. If Government research stations were willing to undertake work on subjects of general application, would you welcome some representative of Government on your organisation? Have you considered that at all?—For what purpose?

23048. To keep touch with you on questions of research, and possibly to be there to interpret the needs of your particular industry in terms of administrative action. You told the Commission a short while ago that representations had never been made to Government on this question of giving over certain forest areas to tea growing; it might be well worth your while to be in close touch with Government so that subjects of that sort could be dealt with by representatives of the Government and taken to higher authority?—(*Mr. Crawford.*) We of course exchange publications, and Mr. Carpenter attends all the conferences at Pusa, so that we keep in touch with Government to a certain extent. (*Mr. Carpenter*):—Personally I am in touch with such institutions as Pusa, but there is no official touch except that I am a member of the Board of Agriculture, which meets once in two years, as, being Chief Scientific Officer of the Indian Tea Association.

23049. Of course, your problems are not parallel to the problems of the cotton industry, because in the main yours is a planter's crop, whereas cotton is a ryot's crop?—I should rather like to take exception to that.

23050. Well, please do so?—I think there are many problems which are fundamental and which have not been investigated in India; it is that lack of fundamental research from which India is suffering.

23051. I am not sure you understood my question, but that is noted. Those are problems which I take it in your view might well be undertaken by Pusa?—Yes, some central research station that is set apart for research questions connected with fundamental research.

23052. *Sir Henry Lawrence*: Have you raised any of these particular problems at these meetings of the Board of Agriculture?—On one occasion I told the Board of Agriculture that I thought we needed an opportunity of discussing when all scientific officers were present, some of these problems. But the Board of Agriculture meeting is hardly a suitable time to do it; it met for another purpose.

23053. They appoint sub-committees occasionally to go into further detail, do they not?—Yes.

23054. Is that problem suitable for sub-committee discussion?—No, I think we want something entirely different from the Board. The Board is there for the purpose of advising the Government of India in regard to agricultural matters.

23055. But the Board also undertakes special investigations and arranges for them. It seems to me you could get what you want done by your presence at the Board, if you put it to them, could you not?—I think it would be difficult; it might be possible; I should like to see it possible.

23056. Have you any suggestion to make as to the way in which your problems could be investigated?—I think there should be some standard reference committee where one could raise problems which one considered of fundamental importance; these problems should be collected from all India; those that were of greatest necessity, as judged by the answers received from the various districts, should receive attention at the central research station.

23057. *The Chairman*: Mr. Crawford, you will have an indication of the direction in which some of our minds are working when you come to look through the verbatim report, and if your Association care to forward us any views on these subjects, we should be very glad to receive them?—(*Mr. Crawford.*) You intend visiting Tocklai later; when you have seen Tocklai you might desire some further information, in which case we are at your service.

23058. *Sir Henry Lawrence*: You mention that your area under tea is growing; can you tell us what your present acreage under tea is?—The total acreage is

728,000 acres; total production for India is 363½ million lbs., 61·93 per cent. of that is in the Assam Province proper.

23059. On that acreage you employ on the average about 3 persons per acre, do you?—No, as a rule about 1½ is a very full allowance.

23060. You gave the figure as 3; was that including women and children?—Yes, that was everyone on the estate. As a rule we consider we are well laboured if we have 1½ working coolies per acre.

23061. So that your labour force is a little over a million: 1,100,000, and the total population is between 2 and 2½ millions?—The total tea garden population of Assam is about 1½ millions; in Assam and Bengal the workers number about 862,000.

23062. I should like to have rough figures for the whole of India rather than for Assam only, with a view to seeing what is the value of the industry to the employment problem of India?—Assam's report which is just out gives 994,000 as the total strength of the labour force in Assam.

23063. And you say that is 60 per cent.?—That is about 61 per cent. I should think there are fully 1½ millions.

23064. That is your labour force?—Yes.

23065. And the total population, with women and children, would be about double that?—(*Mr. Milligan*) That figure includes women and children.

23066. You refer to the competition of Java in the Australian market; is that competition increasing generally?—(*Mr. Crawford*) Yes; I have some figures here which will give you the outline you require (*document handed in*).

23067. That is contained in your statement which we have?—Yes.

23068. The total outturn of Java has increased four-fold within the last twenty years?—Yes.

23069. It now exceeds the output of China?—I have not the figures of the production in Java available.

23070. There are some here in this statement. Is the Java tea industry receiving any special assistance from the Java Government?—(*Mr. Carpenter*) Yes, the Scientific Department is supported by Government.

23071. You are suggesting that some steps should be taken to assist your industry because of the competition of Java in Australia. Is that competition also world wide?—It is. Of course, at Home we have a preferential duty in our favour, but in Australia we have against us this export duty. We are not suggesting Government assistance in regard to our Scientific Department; we are more concerned with the removal of what we consider a war duty, the export duty.

23072. But the Australian market represents only about 1 per cent. of your export?—It is a very small percentage, but still we do not want to lose it if possible.

23073. I only want to get the whole thing in perspective. You speak of the advantage given by preference in the Home market; the Home market represents 80 per cent. of your total production?—Yes.

23074. I notice from your statement here that your expenditure on propaganda in the United Kingdom is very much less than in other areas?—We have really no expenditure on propaganda in the United Kingdom. You refer to the tea cess?

23075. Yes?—We have an expenditure of £10,000 in France. The American expenditure of course last year was exceptionally heavy owing to the Exhibition; we spent £10,000 on propaganda at the Philadelphia Exhibition.

23076. From what area in India do you get most of your labour?—In Assam and the Dooars from Chota Nagpur, Central Provinces, United Provinces, Madras.

23077. Have you got much of your labour from Madras?—A fair amount. (*Mr. Milligan*) It varies. From Northern Madras there has always been a steady influx of labour to Assam; but from the middle of Madras sometimes we have a considerable number and at other times not; at present we are getting very little.

23078. Do you employ the depressed classes; have you any prejudice against them?—(*Mr. Crawford*) No. (*Mr. Milligan*) There is an objection on the part of the Government of Assam to criminal tribes. We have tried several times to

import criminal tribes on a large scale, but the Government of Assam are always objecting.

23079. Criminal tribes and depressed classes are not synonymous terms?—No, the ordinary impoverished classes are the people we usually do import.

23080. Have you got the percentage from Madras?—Very approximately 15 per cent. last year.

23081. But your largest number of recruits come from the tribes of Chota Nagpur?—Yes, until recently; during the last five years they have had a series of very good harvests in Chota Nagpur and recruiting there has dropped down practically to nothing; but it is showing signs of revival this year.

23082. Are there any restrictions imposed by Government which interfere with your recruitment, say, in Madras?—As a matter of fact, we get more assistance from the Madras Government than from any other Government; they have always been very well disposed towards recruitment for Assam; but there is a body of restrictions contained in Act VI of 1901, as subsequently amended, which makes it extremely difficult for Assam to make a start in a new place. Once you have got a good connection with a certain place, it is fairly simple, but it is practically impossible to tap new sources of labour.

23083. Why?—Because the only person you can employ for the purpose is a *sardar* sent down from the gardens; he is a labouring man; if he does not belong to that district, he goes there as a perfect stranger and his chances of success, except in times of famine or something of that sort, are practically *nil*.

23084. Have you represented that difficulty to any Local Government?—Yes, repeatedly, and at the present moment it is being represented in rather a more comprehensive manner than previously. (*Mr. Crawford*) The resolution on immigrant labour in Assam of the Assam Government has just become available; it says, "It has long been recognised that the provisions of Act VI of 1901 are out of date and that with the amendments which have since been made in it the Act constitutes a patchwork which it is difficult to interpret or to administer. The question of the replacement of the Act by legislation better suited to the conditions of the present day has been the subject of anxious consideration both by the Tea Industry and by the Local Government."

23085. We know that phrase very well, but what does it mean? What is going to be done?—We have given the matter our anxious consideration and we have put up a note to the Government of India which is presently having the consideration of the Member-in-charge. Beyond that I cannot go at present because we have had no expression of opinion from the Member-in-charge.

23086. But do you wish to get some relaxation of these restrictions?—Yes, while preventing any abuses being introduced. That refers to Assam. Dooars is under no restriction except such restrictions as are applied by ourselves. (*Mr. Milligan*) May I give an example of the way it operates. Some years ago there was a famine in the Chhattisgarh Division of the Central Provinces; the Commissioner of the division said to me, "Can you possibly take away large numbers of these people to Assam, they are starving?" I said, "I am sorry, it cannot be done; this Act makes it impossible." He had to open famine relief camps and feed the people as best he could, because this Act made it impossible for us to take these people in a mass like that and divide them up in Assam. It would have been necessary to send down individual recruiters from particular gardens who might or might not have succeeded in getting in touch with these people and taken them away.

23087. Your point is that these restrictions refer to a condition of affairs which existed before your Association improved the conditions of labour on the tea gardens?—As a matter of fact, up till eleven years ago things were not nearly so bad; before that you could recruit through contractors; but the contractors' system fell into such disrepute owing to the abuses that occurred and that facility was taken away from the industry and we were confined entirely to the *sardari* form of recruiting. It has not really to do with conditions in the gardens; these restrictions are the direct result of abuses. They took place in the course of recruiting itself. In the Commission of 1906, the Government of India in their Resolution record their satisfaction that the Commission found the conditions of coolies in tea gardens satisfactory.

23088. On the point as to your obtaining certain areas of forests for the development of tea gardens, what is the revenue that your tea gardens pay per acre to the Government?—It varies; there is fee-simple land and there is land which has been taken up more recently on a much higher rent. Fee-simple land pays something

very small indeed; but, of course, there would be no question of that in this forest area; Government could put the land up to auction and get very big prices for it. In fact the offers which have been made to Government, so far as money is concerned, have been very attractive one would have thought.

23089. Can you give me any figure?—I cannot personally; I can only give hearsay evidence.

23090. Well, hearsay evidence is good enough?—I remember one offer being made to the Government of Rs. 100 an acre.

23091. That is occupancy right, and there would be a rental of about Rs. 2 per acre I suppose?—This was in the Dooars where it is laid down by law that the rent shall not exceed the rent of the highest rented paddy land in the portion of the district where the garden is situated; in that case it would have been Rs. 2-8-0 an acre.

23092. How many thousands of acres are in view as to possible additions to the tea area?—As no definite survey has been made, it is difficult to say.

23093. Is it two or three thousand acres or ten thousand acres?—I doubt if it is as much as 10,000 acres; but the point is that it is absolutely first class tea land, whereas a lot of the new gardens which have been opened out in recent years and are still being opened out are on inferior fourth class land.

23094. The Forest Department are making 4 annas an acre revenue?—Some of it I think actually makes a loss; not every district in the Forest Department pays.

23095. I want to know the relation between the public revenue that is being foregone by the Government, whether it is of Bengal or Assam?—It is very difficult to arrive at that because we are talking of particular sections of a place and the whole place is not uniform; by dividing the revenue of Government by the acreage of the forest you will not get a fair result. Some of these lands that are particularly suitable for tea are also very suitable for timber; in the Dooars particularly some of the best pieces of land for tea land also grow very fine timber so that in that case the profit to Government at the present time is higher than that of the average forest land.

23096. Would it pay better as tea land?—It would not pay better if it was let out for tea on the same terms as the present land is, but if the Government put up these pieces of land to auction or accepted the best offer made, they would get very much more for it than they are getting at present.

23097. Do you say that as a revenue proposition it is in the interests of the Government to accept the offer?—I think so.

23098. *Sir Ganga Ram*: These figures that you have just now quoted do not represent the price for the absolute sale of the land. Supposing Government sold the land absolutely, subject to land revenue of course, how much would they get?—(*Mr. Milligan*) What title are you suggesting?

23099. Absolute proprietary rights?—But the Government in Bengal and Assam never give absolute proprietary right nowadays.

23100. Supposing a new policy were adopted. I suppose they do not do it because it is subject to Permanent Settlement?—No, land in the forest area is not permanently settled.

23101. In the Punjab enormous quantities of land are sold and new canals and irrigation works are constructed with the revenues thus produced?—They sell, and in addition to that they take land revenue.

23102. The proprietary rights are not absolute?—No, what I suggested is tantamount to a sale except that there would be no permanent tenure.

23103. In the Punjab, we have to pay a very heavy figure to purchase proprietary rights; supposing the Government of Bengal adopted the same policy, would not they get three or four times the price?—Yes, I should think it is very likely they would, but it is very unlikely that they would do it, because if they did they would be pressed on all sides to go on with that policy; all the tea gardens would immediately want to buy up their land.

23104. What percentage of your labour comes from Bengal?—Practically none; of course, there are recruiting centres in Bengal at Midnapore and Bankura, but the labour recruited from Bankura is not Bankura labour.

Messrs. T. C. Crawford, P. H. Carpenter and J. A. Milligan.

23105. Is that due to the home-ridden tendency of the people or is it, if you will pardon my saying so, that there is a general rumour that you people sometimes treat the coolies very unkindly?—It is due to the nature of the Bengal cultivator; he goes in for subinfeudation to an extraordinary extent, far more than any other part of India. Rather than become a labourer and go abroad, he will manage somehow or other to get a small interest in a bit of land.

23106. We learnt from the Collector's evidence that 20 per cent of the people are starving?—They are certainly in great poverty in Bengal but the people who are starving most are people of the *bhadralog* class who are impoverished by the subinfeudation system.

23107. What wages do you give the labourers?—(*Mr. Crawford*) I think it is better to pass over the Government statistics (*document handed in.*)

23108. You are manufacturing tea only for the English market?—We are manufacturing for the world market, but the main export is to England.

23109. You have not exported to the markets of Kurdistan?—Kurdistan takes very little tea; to a great extent it is green tea.

23110. You do not make green tea?—A little, not much.

23111. Is there any extra cost involved in making green tea?—You lose in weight by making green tea; you do not get the same amount of green tea from the same amount of leaf as you get when you are making black tea.

23112. I understand from the Punjab people that green tea can be made from inferior leaves?—It is made from inferior leaves there.

23113. I mean from the economic point of view does it pay you better to make black tea or green tea?—It pays better to make black tea but there is no market for black tea in Kurdistan.

23114. Now it all comes from Russia?—Yes, I think from Russia. A certain amount filters through; we sell it ourselves.

23115. The bulk of the imports into Kurdistan come from Russia?—Yes, not only do they grow green tea but there is also demand for a very superior kind of China tea which the higher class people drink.

23116. You do not make China tea?—No; we have China trees but we do not make China tea. (*Mr. Milligan*) China tea is made round Almorah.

23117. There is also a demand for China tea in England?—Yes. If you are interested in the matter, if you try Almorah tea, you will not know it from China tea.

23118. In the Indian market, the price of the China tea is double that of Darjeeling tea. I know high class people in the Punjab prefer China tea?—Yes. (*Mr. Crawford*) Of course, the best Darjeeling tea as a rule goes to the Home market; there is a demand for it there.

23119. You think that in the Government so-called waste lands there is a large area which could be brought under tea cultivation?—In the forest land there.

23120. What fertilisers do you use?—(*Mr. Carpenter*) We use practically every kind of fertiliser that there is on the commercial market.

23121. I am thinking of fertilisers containing nitrogen, phosphate and potash?—Yes, we use them.

23122. I understand the tea trees bear for two years; every two years you have to plant new trees?—(*Mr. Crawford*) No, it bears at all times.

23123. How often do you renew the tree?—We have tea which has been growing for sixty or seventy years.

23124. Do you adopt any inter-culture of potatoes?—No; we tried indigo some years ago but it was a failure.

23125. Indigo will give you a very good fertiliser?—We used it as a green crop; that was only an isolated experiment, it was not general.

23126. What kind of wild animals are you harassed by?—Mainly elephants.

23127. In Darjeeling?—Not in Darjeeling; in Assam.

23128. Have you improved the means of transport for tea to the railway stations?—Our communications in Assam are very bad.

23129. Do you not construct feeder tramways?—There are some tramway systems.

23130. That is a very cheap way of doing it in view of the fact that the land is all on the slope, is it not?—(*Mr. Milligan*) The land is not on the slope in Assam; tea is planted on the flat there. In Bengal, in the Dooars it is also mostly on the flat; in Darjeeling, of course, it is on the hills. The bulk of the Assam tea land is almost as flat as paddy land.

23131. I understand you do not admit that the scarcity of labour is due in any way to unkind treatment of the coolies?—(*Mr. Crawford*) No, we repudiate that suggestion entirely. Of course, in dealing with a million of people there are isolated cases. (*Mr. Milligan*) What you say is true in the case of particular gardens but it is not true of the industry as a whole.

23132. Is it not one of the functions of the Association to prevent that sort of thing?—(*Mr. Crawford*) No, the Association has no disciplinary powers over individual managers.

23133. Have you any difficulty with regard to drinking water?—No, in all our gardens the question of water-supply has been receiving increasing attention; we have provided deep wells. Where we find it a practical proposition we put in artesian wells.

23134. Do you give the same water to your labour force?—We make a special point of water-supply; our medical officers are expected to report monthly as to the condition of the water-supply.

23135. Does your European population suffer from malaria?—Yes.

23136. *Sir Thomas Middleton*: With regard to agricultural education, you state that the men are lacking in laboratory skill and you attribute that to the system of teaching; may it not be that it is the examination system rather than the teaching system that is at fault?—(*Mr. Carpenter*) Yes, I am quite willing to include that.

23137. The primary fault is with the examination syllabus?—What I meant to convey was that some of those men can be taught.

23138. But they do not have a sufficient number of hours in the laboratory during their training period?—Yes.

23139. That is your complaint?—Yes.

23140. Who takes the meteorological observations in the tea districts?—The Meteorological Department have certain stations but they are insufficient in number.

23141. Are there no stations on any of the tea estate?—Yes, most tea gardens keep their own temperature and rainfall records.

23142. Is any sunshine record kept?—No. These records are not taken under standard conditions and consequently are not comparable; we can only use the meteorological survey statistics.

23143. There is no system by which the instruments are furnished by the Meteorological Department, you taking the observations in the tea gardens and the work being inspected?—The Meteorological Department are not at all willing to provide the instruments.

23144. Did you state that there are no sunshine observations in the tea districts?—Only those that we ourselves take in our department.

23145. *Dr. Hyder*: I direct your attention to Question 21, Tariffs and Sea Freights. Is Ceylon one of your competitors in the world market?—(*Mr. Crawford*) Yes.

23146. Do you know what the export duty in Ceylon is? Is it not double what it is in India?—I think it is more than the Indian duty.

23147. Is this competition that you are meeting in the Australian market entirely at your expense? Is it not a fact that Java has been displacing China tea, not Indian tea?—Certainly, Java has been making headway in Australia at the expense of China but I should say also at the expense of Ceylon and ourselves.

23148. Is it not a fact that your share of the world market has increased from 39 to 49 per cent while the share of Java has increased from 8 to 12 per cent?—I cannot give the figures; I did not come prepared.

23149. Do you give the labourers any allowances in kind and if so what?—Of course, we enter into agreements in Assam; they are not legal since Act XIII was abolished. A bonus is granted every year; that is Rs. 12 per man and Rs. 10 per

woman. We give three months' full pay, or more if the medical officer requires it, to pregnant women who are paid Rs. 5 at the birth and another Rs. 5 afterwards; we provide free medical attendance; all our estates are fully equipped with medicines and hospitals or dispensaries; there may be a few here and there which are not as fully equipped as we would wish for. We have, as I have already said, an Indian doctor in charge of each estate. We give quinine free; we make no charge whatever for drugs. In addition to treating people on our own gardens, we frequently give drugs to people from outside who get employment on our gardens.

23150. Apart from these money allowances, do you give them land?—We give them land as far as possible.

23151. Do you still give land?—We still give land as far as we have it.

23152. Is there any difference between your system of marketing and the marketing of jute; have you a smaller number of middlemen through whose hands tea passes than in the case of jute?—I am afraid I cannot say; I am not an authority on the subject of jute. We consign our tea either to London, to the Agents of the Companies concerned, or we consign it to be sold by public auction in Calcutta.

23153. Am I to understand that there are only one or two hands through which tea passes, either your managing agent here or some managing agent elsewhere who makes over the tea to a broker?—Yes, between the managing agent or the control of the company and the actual buyer it only passes through one hand, that is the broker, who gets his commission.

23154. That is not so in the case of jute?—I cannot speak for jute.

23155. We have been told that nitrate of soda is liable to deterioration through being washed away; is that so?—(*Mr. Carpenter*) Assam is a country of heavy rainfall and the demand for nitrate of soda is limited on account of its liability to be washed away as compared to sulphate of ammonia. It washes away fairly rapidly and from one of the experiments I have been able to carry out it does seem to wash out quicker than sulphate of ammonia.

23156. *Mr. Calvert*: Is your Association taking any steps to prevent the export of adulterated or inferior tea?—(*Mr. Crawford*) We do not trouble about that; the people we deal with have their own system for stopping the sale of inferior tea. At home they have a certain standard, as they have in America. We are more concerned with preventing the sale of undesirable tea in India.

23157. But your reputation would go up if your general standard of quality were high?—Each producer sells his tea on a particular garden mark; if any garden ships an undesirable quality of tea or one which is unsuitable, it does not receive attention from buyers so that it comes home to them in time. You do not think it is necessary to take such steps?—If you ship home stalky tea at the present moment you do not get the same price as you do if you ship good tea.

23158. Has any economic use yet been found for the tea seed?—There were certain experiments but I do not think they were proceeded with. Of course, seed is only obtained in any quantity from seed bushes which are allowed to grow. There is at present an inquiry for tea seed from Kenya, Java and other places.

23159. Is it a grievance with you that potassium nitrate has to pay an import duty?—(*Mr Carpenter*) If it means that potassium nitrate would supply nitrogen and potash at a lower rate than that at which we are now supplied, it is a grievance. In tea gardens we practically never use potassium nitrate now because the price is too high.

23160. Is that because of the import duty?—Possibly.

23161. It is 15 per cent.?—We simply do not use it because the price is prohibitive.

23162. *Mr. Kamat*: The export duty on tea is Rs. 1-8-0 per 100 lbs. which gives a revenue to the Government of about 50 lakhs a year?—(*Mr. Crawford*) Yes, round about 50 lakhs.

23163. So far as the cost price is concerned it works out at less than a quarter of an anna per lb.?—Yes.

23164. Your argument is that if this duty is abolished the amount spent on labour would be increased, is that right?—Well, we should have more money available to spend on labour.

23165. That is to say, it is a question of improving wages or looking to the interests of the general taxpayer, one of those two alternatives; is that right?—Yes, you can put it in that way.

23166. Can you suggest any other method of raising this money from the general taxpayer?—I can understand that the Government do not want to part with this source of revenue. I cannot suggest any other tax.

23167. Is there any guarantee that, supposing this export duty were abolished, the money would be spent on labour?—I could not commit myself to that statement.

23168. In what way do you suggest labour would be benefited if this tax were abolished?—It makes more money available between the cost of production and the selling price.

23169. The difference might go into the pockets of the planter?—No.

23170. I want to know what guarantee there is that the money would be spent on the improvement of labour? Why do you assume that? What is the general level of cash wages paid to your labour?—It is very difficult to say because it varies so much in the different districts. In the Dooars district at the present moment the men are earning up to 12 annas a day; in Assam they are earning from 8 annas up to 12 annas. In the plucking season women make very good wages, up to a rupee a day.

23171. This export tax amounts to a quarter of an anna. Supposing that amount of money went to the industry, do you mean to say that instead of paying 12 annas a day for labour you would pay 12¼ annas?—That, of course, does not apply because you are dealing in one case with a daily wage and in the other with production.

23172. I am trying to see if there is any guarantee?—There is no guarantee.

23173. In that case, if you admit that, the whole of your argument falls to the ground?—*(Mr. Milligan)* In a great many cases it is bound to go to the labourer because at the present moment, while there are great many gardens which are making handsome profits, there are a lot of gardens that are just paying and no more; those gardens are always lagging behind in the matter of raising the wages of their labourers. They are very anxious to raise wages in order to get more labour; and they would undoubtedly spend this money on labour.

23174. That means that you will not be increasing the wages of the whole of the labour; it would only benefit a section of the labour?—In the case of the gardens which are making good profits, there is no need to increase wages because the labourers are getting as much as they care to earn now.

23175. *Mr. Gupta*: Am I correct in saying that most tea gardens have a fair amount of spare land for future expansion?—Certain gardens have but not most gardens.

23176. Most of the larger gardens have?—I should not say so.

23177. What percentage would you say?—I could not answer a question like that.

23178. I have visited some gardens and they seemed to have land kept for future extension?—In Dooars at the present time.

23179. I am referring to the most of the older gardens?—They have not much room for extension.

23180. Were not the rules in regard to the cultivation of Government waste lands circulated to the Secretary of your society when they were framed for consultation and further opinion?—When was that?

23181. The last was about three years ago as far as I remember, and your Association, I suppose, concurred with the rules that were framed on behalf of Government?—I do not recollect that.

23182. But that is a fact; I was only trying to point out that the Government in framing these rules did consult the industry?—That is so far as the Dooars are concerned. Of course, I am referring more particularly to Assam.

23183. *Sir Ganga Ram*: Have you ever considered the question of bringing down rock silt in the streams; would not that be of great value in your tea plantations?—*(Mr. Carpenter)* In places that is made use of when it is rich inorganic matter; that is to say, in temporary streams; but silt from rivers has often proved very dangerous.

23184. Silt from rivers is rather injurious?—Yes.

23185. But silt from rocks is a matter which is under the consideration of the scientists, is it not?—Yes.

23186. Might not you set up some works which would throw the silt into the streams so that it could be utilised by the agriculturists below?—Yes, it goes on to the lower flats.

23187. Have you taken any steps to collect dung from the forest grazing grounds?—I think not. (*Mr. Crawford*) No, not from the forests. (*Mr. Milligan*) The nearest grazing grounds are always a long way from tea gardens; there are no roads to the grazing grounds and the cart hire would be prohibitive.

23188. Have you considered the question?—(*Mr. Milligan*) I am not a practical planter.

23189. And the leaves that fall from the trees?—That has often been done.

(The witnesses withdrew.)

APPENDIX

Statement showing the position of the Indian Tea Industry in the world market by Mr. John Harpur, Commissioner for India, Indian Tea Cess Committee

Separate Government statistics, relating to tea produced by members of the Indian Tea Association are not kept; furthermore no statistics are available either to show the destination of tea exported from any particular district in India or even the percentage of the total production which is exported from the different tea producing districts, so it is not possible to state by what percentage the Indian Tea Association's share of the world's market has increased (before the War as compared with the present date).

The following items may be of some interest and use :—

(*a*) During the year ending 31st March 1926, the total area under tea in India (Northern India and Southern India) was 728,812 acres, the total acreage belonging to the members of the Indian Tea Association was 513,234 (or approximately 70 per cent.). The association's sphere is in North India—the corresponding Association in South India is the United Planters' Association of Southern India—and the Association represents about 88 per cent. of the acreage in North India.

(*b*) The following is a comparison of the total exports of tea from the principal tea producing countries for the years 1913-14 and 1925-26 :—

	Exports		Percentage of increase or decrease	Percentage of total share		Percentage of increase or decrease
	1913-14	1925-26		1913-14	1925-26	
	lbs.	lbs.				
India* ..	291,715,041	337,314,760	+15·6	37·6	43·3	+5·7
Ceylon* ..	197,419,430	209,791,384	+6·2	25·4	26·9	+1·5
China* ..	191,534,133	111,067,733	−42·01	24·7	14·2	−10·5
Java* ..	64,938,907	94,774,200	+49·9	8·3	12·1	+3·8
Japan† ..	29,540,945	25,131,125	−14·9	3·8	3·2	−·6
	775,148,456	778,079,202				

(*c*) The principal tea consuming countries in the world : (the following are the Home consumption figures compiled by Tea Brokers' Association of London, 1925) :—

	Lbs.	
Great Britain and Northern Ireland ...	401,996,203	
United States of America	100,159,110	
India	50,000,000	(estimated).
Australia	49,256,000	
Canada	36,255,149	
Irish Free State	23,305,356	
Holland	16,152,400	
New Zealand	10,834,616	
Russia‡	23,302,858	
British South Africa	10,000,000	(estimated).
Persia	11,932,560	
Morocco	12,000,000	(estimated).

*Figures are taken from Indian Tea Statistics, 1925 (Supplement to the *Indian Trade Journal* dated November 11th, 1926).

†Figures are taken from the Shidzukota-Ken Tea Refiners' Guild.

‡According to the *Tea and Coffee Trade Journal's* correspondent in China, Russia's pre-war consumption was 189,680,000 lbs.

Messrs. T. C. Crawford, P. H. Carpenter and J. A. Milligan.

THE INDIAN JUTE MILLS ASSOCIATION, CALCUTTA

Replies to the Questionnaire

QUESTION 2.—AGRICULTURAL EDUCATION.—Replying generally to the questions on the subject of agricultural education, the jute interests represented by the Bengal Chamber of Commerce would say that there is practically no such education in Bengal. They understand that a beginning has been made in the Punjab, and they believe also in Bombay, towards giving elementary instruction in agricultural matters. They are not sufficiently in touch with developments in this direction in these Provinces to feel assured that instruction on similar lines in the jute districts could be adopted with advantage; but they would like to see the experiment made.

The demonstration farms conducted by the Agricultural Department are excellent as far as they go, but only the ryots who live in the immediate neighbourhood of them derive any advantage from the demonstrations. The ordinary cultivator is of course very conservative, and he is not readily convinced of the advantages that may follow on a change in his methods; a greatly extended system of demonstration farms, aided by a large staff of efficient demonstrators, would help in this direction, but the cost would be very heavy. On the other hand, the existing schools might, with considerably less expenditure, be made use of on the lines we have suggested above by giving some elementary instruction in simple agricultural processes; and although jute interests are a little doubtful whether this would do very much good without being supplemented by expert demonstration, the experiment is worth trying. It might be attempted in one of the important jute districts, and the results there carefully watched. The Dacca district suggests itself, as the Agricultural Department would be able to keep closely in touch with the progress of the work. It is only by demonstrating that improved methods of cultivation mean more money that adult education in rural districts can be popularised [sub-question (*xii*)].

The Chamber does not feel qualified to offer any strong opinion as to how a scheme for better educational facilities in rural areas should be administered [(sub-question *xiii* (*a*)]. They understand that administration might either be central, from Pusa, or provincial; they would be inclined to think that, with a crop such as jute, 90 per cent. of which is obtained from the Province of Bengal, administration by the Bengal Department of Agriculture would be preferable. With regard to sub-question *xiii* (*b*), Finance, this must be provided, in the first instance at any rate, by Government. Possibly the co-operative credit societies might be made use of in some way, but the responsibility must rest with Government.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(*a*) The existing demonstration farms have to a small extent sometimes improved the methods of the cultivators but, as has been indicated in replying to Question 2, the area in which a farm can do good in the way of demonstration is necessarily restricted to its own vicinity.

(*c*) As stated above on Question 2 (*xii*), the inducement to a cultivator is a matter of money. If he can be convinced that it is to his financial advantage in the near future to adopt new methods, he will listen to expert advice. Recommendations, unless they can be put in such a way as to carry conviction, will not in themselves be sufficient. And the cultivator will not be interested if the financial benefit is likely to be more or less remote.

QUESTION 4.—ADMINISTRATION.—(*a*) and (*b*).—Speaking generally, the Chamber considers it advantageous that research work, particularly with crops grown in different parts of the country, should be centralised at, or at any rate directed from, Pusa. But as they have indicated above, in the case of a crop like jute which is confined to one part of the country, and 90 per cent. of which is grown in one Province, the position is different, and it seems to them that the administration of this work can be more effectively carried on by the Local Government. But they regard this matter as being one for expert opinion and commercial interests would not be disposed to criticise the means as long as the end is attained.

(*c*) (*i*) *Agricultural Service.*—Funds have never been available to allow of the Agricultural Department being sufficiently staffed or carrying out an adequate programme.

(*ii*) *Railways and Steamers.*—Jute interests are, speaking generally, satisfied with the services afforded by railways and steamers. They feel, however, that railway

rates have recently been enhanced to a greater degree than is reasonable, especially in proportion to the increases on other goods. There is also a tendency on the part of the railways to starve stations where they are not in competition with the steamers, and the steamers are sometimes considered to take similar advantage of the absence of competition.

(*iii*) *Roads.*—In the jute districts of Eastern Bengal, waterways are of more importance than roads, and in recent years sufficient attention has not been given to the maintenance of these. Serious silting up has taken place in certain of the main Sunderbunds channels and elsewhere. A case in point is the English *nullah*, a waterway which forms the only channel for the despatch of jute from an important area. The Chamber has had occasion, during the current season, to draw the urgent attention of the Government of Bengal to the serious position which has arisen through failure to keep the channel clear. The Chamber has been informed that the amount of dredging required is very small.

Again, in some districts the encroachment of the water-hyacinth threatens to block up the small waterways altogether. At the annual meeting of the Associated Chambers of Commerce of India and Ceylon in 1925, a resolution was unanimously adopted urging the necessity of legislation to enforce the destruction of the weed. It is understood that legislation of this nature has already been introduced in Madras, with beneficial results. The Bengal Chamber is again bringing the matter forward at the Annual Meeting of the Associated Chambers, which takes place at Cawnpore on 6th and 7th December.

(*iv*) *The Meteorological Department.*—Jute interests are quite satisfied with the work of the Meteorological Department.

QUESTIONS 5 AND 6.—FINANCE AND AGRICULTURAL INDEBTEDNESS.—Government should take every opportunity of extending the scope of the co-operative credit system. It is by means of credit societies and similar organisations that the Chamber thinks agricultural operations can best be financed, and the cultivator freed from the necessity he is now under of borrowing from moneylenders—his only source of credit in the absence of a credit society. He has to pay the moneylender such high rates of interest that he has little chance of getting free, for apart from ordinary living expenses he has to make large payments for marriage and other ceremonies. Generally speaking, the ryot seems unable to save money even when he has the opportunity of doing so. In 1925, for instance, when jute prices were high and he had a chance of freeing himself from his debts, he did not take advantage of his opportunity but spent all the money he received.

QUESTION 10.—FERTILISERS.—(*a*) In the greater portion of the area on which jute is grown, the use of manures is unnecessary because the land is subject to inundation every monsoon, and needs no manure beyond the silt which is then deposited, and which is in itself a sufficient fertiliser. The position is of course different in the case of high land jute, and the greater use of fertilisers in these areas would be advantageous. This can only come in time (*a*) with the education of the cultivator and his appreciation of the money value of careful manuring, and (*b*) with cheaper prices for artificial fertilisers, the high cost of which certainly militates against an expansion in their use.

(*f*) The cultivator in the jute districts, speaking generally, has no option but to use cowdung as fuel, for the simple reason that he cannot get wood or any other substitute. Theoretically of course it would be excellent if he could do without cowdung and keep it for manure but practically, for the reason stated, this is impossible. It does not seem likely that any substitute will ever be available at a price that would make it possible for the ryot to use it instead of cowdung.

QUESTION 11.—CROPS. (*a*) (*i*) THE IMPROVEMENT OF EXISTING CROPS AND (*iii*) THE DISTRIBUTION OF SEEDS.—Jute interests have always endeavoured to co-operate with the Department of Agriculture in questions connected with the jute crop, and for some years conferences have been held periodically for the interchange of opinions on these questions and on the work of the department. A Board of Assessors assists on questions in connection with the different types of jute, the Board representing the different branches of the trade. The types are examined and reported on by the Board, and it is understood that their reports are found to be of assistance to the department. In the jute growing areas a number of the jute firms have placed land at the disposal of the department for the conduct of their experiments. A difficulty in connection with the seed question is that the cultivator prefers to grow his crop for fibre rather than to keep some of it for seed;

and it should be explained that, when kept for seed, the plant gives a very poor quality of fibre which can be used for only the coarsest manufacture.

The seed supply has been a subject of particular study by the Department of Agriculture, the contention being that Government seed, where it is used, has considerably increased the outturn per acre. In this work jute interests have co-operated. Some years ago consideration was given by the Indian Jute Mills Association to a proposal that the Association should start and maintain a series of seed farms, but this suggestion was found to be outside the region of practical politics. During the past year, however, another proposition has been carried through. The indications were that, with high prices for raw jute in 1925, the supply of seed for the 1926 crop was likely to be far short of what was required, and the situation was the subject of discussion between jute interests, particularly the Indian Jute Mills Association, and the Department of Agriculture. As a result a scheme was drawn up under which the Association would give a guarantee to the department up to a total of Rs. 2½ lakhs, in the event of Government sustaining any loss by arranging for planters in Bihar to grow jute from seed supplied to them, such jute to be grown for seed; Government would undertake to purchase 10,000 maunds of seed so grown at Rs. 25 per maund, the idea being that the seed should be sold to the cultivators for their 1927 crop. It transpired that Government could not accept the Association's offer of a guarantee as the distribution of departmental seed had been handed over to an agent, so that Government no longer dealt directly with the cultivators in the matter of the supply of seed; it was explained therefore that any guarantee that might be offered by the Association would be a matter for Government's agent. As matters have turned out, it will probably not be necessary to make the guarantee operative; at any rate, it is understood that Government anticipate no difficulty in disposing of all the seed obtained by them from the Bihar planters, but the information given in this reply will perhaps be of interest to the Royal Commission as indicating the willingness of the jute trade to co-operate with the Department of Agriculture in the efforts of the latter to improve the crop. Jute interests have always to keep before them the fact that the main attraction to the user of jute manufactures is their cheapness. A succession of years of high prices such as those which prevailed in 1925 would be dangerous in the best interests of both the grower and the manufacturer.

QUESTION 12.—CULTIVATION.—This is not a subject on which jute interests can offer evidence as it is a matter for experts, but they might say that so far as their knowledge goes they believe the existing systems of tillage to be suitable for the land. For example, deep ploughing would, if resorted to on silted land, do it a great deal of harm by destroying much of the beneficial effect of the silt.

QUESTION 20.—MARKETING.—The existing marketing facilities are suitable so far as the jute trade is concerned.

QUESTION 22.—CO-OPERATION.—It has been stated above that, in the opinion of jute interests, the co-operative society movement should be developed as a means of financing the jute crop. It is not proposed to go into this matter in detail as it is one for experts, but the opinion is offered that, although the methods of the co-operative societies may in some cases be uneconomic, these can be adequately controlled by Government audit; and it is considered to be of the utmost importance that Government audit should be a *sine qua non*. As has already been indicated, it is felt that the co-operative credit system has achieved only to a very limited extent what was one of its main objects, namely, to get into close touch with the cultivator; and the Chamber is of opinion that there is room for, and the need for, great expansion in this direction.

QUESTION 26.—STATISTICS.—(*a*) (*i*) and (*ii*).—Jute interests would like to see more money made available for staff work on the jute forecasts. They consider that it should be possible to obtain a greater degree of accuracy in these, and they have for a long time past closely examined the question. In 1923, the Jute Forecasts Joint Committee of the Chamber were in correspondence with the Government of Bengal on the subject of the staff of jute clerks engaged to check the estimates of the village panchayats and to carry out crop cutting experiments. The annual cost of the staff of clerks referred to was Rs. 22,600. Government decided that they could not afford this sum and that unless the trade would pay it the staff would be discontinued; they were, it should be explained, acting on a recommendation of the Bengal Retrenchment Committee. The trade took strong exception to this suggestion. The amount involved, was, of course, regarded as trifling, and the fact

that it was so made it all the more surprising that the question should be raised. They pointed out that in export duty alone the jute trade had brought in as revenue to Government during the three preceding years some nine crores of rupees. Notwithstanding the protest of the trade the staff was not restored. Jute interests have all along regarded this incident as unfortunate.

It is unnecessary to refer at length in this answer to the discussion which the Jute Forecasts Joint Committee have had in the past with Government on the subject of the forecast figures. That discussion is still going on, the principal point being that the forecasts of crop are regarded as inaccurate and unreliable. A suggestion has indeed been put forward quite recently by the Jute Forecasts Joint Committee to the Government of Bengal that a Committee of Enquiry should be appointed, on which the jute trade would be represented, to investigate the methods employed in arriving at the forecast figures.

Mr. J. SIME (Chairman), Mr. J. T. FINLAYSON, Mr. J. W. A. SIMPSON and Mr. W. J. SOUTAR, of the Indian Jute Mills Association

Oral Evidence

23190. *The Chairman*: Mr. Sime, you are Chairman of the Indian Jute Mills Association and I understand you wish these other gentlemen's names to appear along with yours as witnesses representing the jute interests of the Bengal Chamber of Commerce?—Yes.

23191. I propose to address myself to you in the main, Mr. Sime; if your associates desire to say anything, they may do so at any time; if they say nothing we shall assume that they agree with what you tell us?—There are some matters with which I shall want my colleagues to deal.

23192. Perhaps you will ask the appropriate witness to do so?—Yes.

23193. Is the Indian Jute Mills Association the only organisation that has any being at the moment in connection with the jute trade?—In connection with the jute trade there are other Associations; there are the Calcutta Jute Fibre Shippers' Association, the Calcutta Jute Dealers' Association and the Calcutta Jute Balers' Association.

23194. All representing various interests or stages in the trade?—Yes.

23195. But there is no Association with regard to jute in the position occupied with regard to cotton by the Indian Central Cotton Committee?—No.

23196. Are you, broadly speaking, familiar with the functions and work of the body to which I refer, the Indian Central Cotton Committee?—No.

23197. Have you ever considered the wisdom of forming an Association representative of all the interests in the trade, including the grower, with a view to attending to the agricultural problems, the research, the marketing, and the processing of jute, and also, if necessary, the interests of the trade abroad?—We have not considered that. Our latest suggestion to the Government was that an Advisory Committee should be appointed to assist in the preparation of the forecast; that is the extent to which we have considered the matter although we think that an Association similar to the Indian Central Cotton Committee would be advantageous to the trade.

23198. Do you think jute could bear a small cess to be spent entirely on the work of such an Association?—The virtue of jute is its cheapness; the continual addition of a little here and a little there to the cost of production, by increasing the cost of material is of course going to affect jute adversely in competition with a substitute.

23199. If that is your view, do you think it would be advisable, if possible, to make an arrangement whereby a small part of the money already collected in the shape of an export tax could be made available to such an Association?—Yes, we think that would be advisable; we think something should be done on those lines for the purpose you suggest.

23200. You know that Government takes a share in the work of the Central India Cotton Committee; they assist with advice and the research side of the Indian Central Cotton Committee's work is supported in every possible way by the organisation as a whole and by the Governmental element in the organisation. Speaking of course without having had full time for consideration, would you consider the advisability of Government having some representative on the Jute Association that we are thinking of?—On the Association you describe the Government would have to be represented.

23201. If taxation for general revenues is used for the purpose of financing an organisation of the whole trade, under those conditions do you think some representation by the Government would be reasonable?—Yes.

23202. On page 415 of your memorandum in answer to Question 10 (*a*) you say, "In the greater portion of the area on which jute is grown the use of manures is unnecessary because the land is subject to inundation every monsoon, and needs no manure beyond the silt which is then deposited." Are you satisfied that this silt provides a complete diet for plants?—(*Mr. Finlayson*). Yes, but if they could use fertilisers as well, it would be an advantage especially in the higher lands.

23203. On the last page of your memorandum, speaking of the Jute Forecasts Joint Committee, you say that you have had discussions with the Government on the subject of the forecast figures, that that discussion is still going on, the principal point being that the forecasts of crops are regarded as inaccurate and unreliable. Do you wish to expand that statement at this stage or would you rather not say anything about it now?—(*Mr. Sime*) The Government are to adopt another method in compiling the next year's forecast and they have assured us that they expect much more reliable results from it; that is where the matter rests now.

23204. The usefulness of these returns consists in the main in the assistance which they give to the trade in estimating as early as possible in the season what the crop is going to be?—Yes.

23205. That does not help the cultivator to decide how much of his land he had to put under jute, does it?—It should influence him with regard to the next year's crop.

23206. What he really wants to know is how much jute is in store at the moment when he is considering planting his crop?—Yes.

23207. How would you consider a proposal to make available for the cultivator that information?—That is available from the statistics in the Chamber of Commerce; these statistics are prepared regularly.

23208. The total jute in storage?—Yes, the approximate amount.

23209. Do you think that might well be made available for the cultivator?—Yes; there is no reason why it should not.

23210. There is no question of secrecy?—Not at all.

23211. It is public information to-day for anybody who cares to come and ask for it; is that the position?—Yes, the mills are storing about 16 lakhs which is in the neighbourhood of 3½ months' consumption.

23212. Is that information published in the newspapers?—That I could not tell you; but all the trade knows it, it is public.

23213. The trade is not the cultivator, is it?—No.

23214. But those figures would be available to Government tomorrow if they choose to publish them; is that the position?—Yes, that is the position.

23215. In answer to Question 20 with regard to marketing you say, "The existing marketing facilities are suitable so far as the jute trade is concerned." Do you consider they are suitable so far as the producers of jute are concerned?—I am not prepared to speak on that matter.

23216. I do not wish to take you into this field unless you are familiar with it; but we are anxious to discover whether the cultivator is getting a reasonable share of the total price?—(*Mr. Finlayson*) At the present time most of the holdings are small; there is no other way in which the cultivator can market his crop. There is no big concern which could deal direct with the cultivator; it would be too big an undertaking. The average cultivator probably takes a maund to a maund and a half into the market at a time; he sells it to a middleman who collects anything from 200 to 2,000 maunds and that middleman takes it to the big buyer. With the holdings as they are and considering the fact that the cultivator sells off his crop gradually, not selling his whole crop at one time, it would be impossible for a dealer to handle it.

23217. Probably the cultivator is in debt and therefore within certain limits has to accept what price his creditor may choose to give him; who comes off worse?—(*Mr. Finlayson.*). Do you mean in the case of his being forced to sell?

23218. Would you agree that the whole system of marketing, the position of the intermediaries who work that system and the margins upon which those intermediaries operate, might be a very proper subject of enquiry, shall we say, by the Central Indian Jute Association, if that were the title of this suggested Association? Might that be a useful thing to do with a view to discover whether it would be possible to improve the system?—I think it would; but the only way we can think of to improve it at the moment is through co-operative societies. The theory that the middleman always takes a profit is a mistake; he takes his risk as every one else does.

23219. Do you wish to supplement at all what has been written here?—(*Mr. Sime*) No.

23220. *Mr. Kamat* : In the jute companies in this Presidency what percentage of the total capital is held by Indians?—You mean jute mills; I should say 5/8ths.

23221. Have the Indians any representation on the Boards of Directors?—Yes; in the firm I am connected with there are two Indians on every Board.

23222. Has any serious attempt been made to form an Association to protect the interests of the jute growers?—*(Mr. Sime)* Not that I am aware of.

23223. No attempt has been made?—No.

23224. Supposing such an attempt were made, do you think it would receive support from you?—Every man must mind his own business.

23225. *Sir Henry Lawrence* : Could you tell me what is the revenue that the jute cess brings in to the Government of India?—The amount which it has brought in is in the neighbourhood of Rs. 3,60,00,000.

23226. Is that the average rate?—That is the average for the last three years. These are the figures :—

	Rs.
1923-24—	
On the export of raw jute	1,58,69,000
On the export of jute manufactures	1,99,10,000
1924-25—	
On the export of raw jute	1,66,29,000
On the export of jute manufactures	2,09,34,000
1925-26—	
On the export of raw jute	1,58,50,000
On the export of jute manufactures	2,09,54,000

So that the total for the year 1925-26 is in the neighbourhood of Rs. 3,60,00,000.

23227. Is it levied at the rate of Rs. 4-8-0 a bale on raw jute?—Yes.

23228. And Rs. 20 a ton on sacking manufactured?—Yes.

23229. No portion of that is used for the benefit of the industry?—None of that is used for the industry; it all goes into the Central Government.

23230. And the Government of Bengal?—Not the Government of Bengal. There is a two anna cess on jute; the amount of the cess paid to the Government of Bengal during the same three years was, in 1923-24, Rs. 9,73,000; in 1924-25, Rs. 10,92,000 and in 1925-26, Rs. 11,16,000. That was for the Calcutta Improvement Trust.

23231. *Sir Ganga Ram* : That was for the improvement of Calcutta?—Yes.

23232. *Sir Henry Lawrence* : You do not wish to have those duties or cesses increased?—No; anything that adds to the cost of jute is bad for the trade.

23233. Bad for the producers?—Bad for the producers; it encourages substitutes; if the price had been lowered during recent years, I am sure there would not have been such a large amount of substitution of other things.

23234. The result of such substitution is that there is less demand for the produce grown in the fields?—Yes.

23235. Of course we are more concerned with the interests of the producer than with your interests?—It seems to me that the interests of the producer and our interests are the same, I am sure ultimately they are.

23236. If the producer can produce jute at a lower rate by any improvements in cultivation, that would benefit both the trade and the producer?—Certainly.

23237. If you can get a heavier crop on the same amount of land, it sets free other land for the cultivation of paddy or other crops. That is a matter to which you have no objection but in which you have no particular interest?—We have an interest in that because we think it will reduce the price of jute.

23238. If, at the present time, a man grows three bales to the acre, and if by using a better yielding plant he can produce six bales to the acre, of course his cost will be less, so that anything that is done for the improvement of jute helps both you and the producer?—Certainly.

23239. *Sir Ganga Ram* : Supposing there was a Growers' Association in the interest of the growers, in what way would your Association help that Association?—I do not know that we could help it very much.

23240. Supposing out of the huge reserves which you have now got you supply money to agricultural co-operative societies at the Government Paper rate, and those societies lend the money to the grower at about 1 per cent above the Government Paper rate, would not that help?—That would not do at all.

23241. Why?—Because the money is not ours; the money is the money of the shareholders of the Company.

23242. But of course you control the shareholders?—No, we do not control the shareholders; it is getting more and more difficult every day.

23243. Is it a fact that 70 per cent of the shareholders are Indians?—Yes, approximately.

23244. Are they adequately represented on the Directorate?—Yes. At any rate in our companies they are.

23245. Do you take them into the Dealers' Association; are there Indian representatives on the Dealers' Association?—Yes.

23246. We were told yesterday that an Indian is barred from becoming a Member of the Dealers' Association?—No; the Indians do not require to join the Association. Are you speaking of selling jute to the mills?

23247. Yes?—They do not require to join the Association.

23248. Supposing they apply for membership, are they barred?—They are not barred; but any Indian can call at a jute mill and sell jute; there is no restriction on him.

23249. Can the Indian become a broker as well?—Yes, certainly.

23250. There is no restriction to buying only through the European Brokers' Association?—Certainly not.

I hope you will consider my humble proposal that you should lend some of your money at Government Paper rates to the Co-operative Societies so that they may lend the money at 1 per cent more to the cultivator.

23251. *Sir Thomas Middleton*: Does the quality of jute vary much with the retting as in the case of linen?—(*Mr. Finlayson*) Yes, very considerably.

23252. Has any work been done by the Association on the subject of jute retting?—(*Mr. Sime*). No, nothing has been done.

23253. Has your attention been drawn to the Linen Industry Research Association which has been established in the North of Ireland recently to study retting problems?—(*Mr. Finlayson*) No; that is a matter which the agricultural farm at Dacca have in hand; they are continually working at that sort of research work.

23254. The Linen Industry Research Association of Northern Ireland is not a Government Association. It is an Association of those interested in the linen industry. You have not heard of their work?—(*Mr. Sime*) No; we have not heard of it.

23255. In the last three or four years, a great deal of time and attention has been given by this Association to studying retting questions in connection with linen; it might be useful for you to get into touch with that Association because it is possible that the discoveries they have made in connection with their studies of the linen plant might have some application to jute retting?—(*Mr. Finlayson*) Retting is done entirely by the natives.

23256. Retting in the North of Ireland is done by small farmers; the object of the industry is to devise a better system of retting?—(*Mr. Sime*). Yes; if the jute could be retted quicker and cheaper, it would certainly decrease the cost and would make jute considerably cheaper.

23257. In the case of linen quality, is the chief matter that enters into consideration; in the case of jute I take it that quality is not nearly so important as in the case of linen?—It is very important; for instance, this year although the crop is a big crop, there is a much larger proportion of inferior quality than in last year's crop due to bad retting.

23258. So that it would obviously be in the interests of the Association if by some action improved methods of retting could be introduced?—Yes.

23259. *Dr. Hyder*: In reply to the Chairman you said you would not favour any addition to the cost of production of jute; is that the position?—Yes.

23260. So that you are opposed to a tax or any increase in tax?—Yes.

Messrs. J. Sime, J. T. Finlayson, J. W. A. Simpson and W. J. Soutar.

23261. Do not the middleman's profits and commission have the same effect as the imposition of a tax by the State; they both add to the cost price at which jute is sold; is not that so?—That is so.

23262. So that, that being so, would you be in favour of a reduction in the number of persons through whose hands jute passes?—Yes, certainly.

23263. Do you know that the English farmer has been dissatisfied and has always grumbled since the year 1880 when wheat was made unprofitable? Do you know that the wheat of the Canadian farmer had to pass through a number of hands but he has been able to reduce the number of hands? Would you not, therefore, favour the formation of some kind of Jute Growers' Association with a view to creating harmony of interest between the jute trade and jute growers?—No; I am afraid the jute trade would not favour that.

23264. Are you aware of any agrarian movement? You may not like that?—Yes; we are feeling it now.

23265. You say the cost of transport has increased; has the classification of goods been changed with regard to the rates on railways and steamers?—I can give you the figures.

23266. If you do not mind, I want you to answer general questions. Is your jute carried at class rates, station to station rates, or special rates?—It is carried at class rates.

23267. Do you know the class rates are rigidly confined between a minimum and a maximum?—Yes.

23268. That being so, has there in fact been a heavy increase?—During the years 1914-15, 1923-24 and 1924-25 the same number of tons was carried but the cost increased by 126 per cent; that is the increase we paid to the Railway.

23269. How much did you pay?—We paid 54 lakhs in 1914-15, 112 lakhs in 1923-24 and 125 lakhs in 1924-25.

23270. That is the total cost of transport on railways and steamers?—Yes, that is the total; the tonnage was the same, 969,000 tons.

23271. Is it railways and steamers put together?—That is only railways, the Eastern Bengal Railway. You get those figures from the Railway Board's Administration Report, Volume II.

23272. *Mr. Gupta*: Your Association is not opposed to any scheme by which the growers could be informed from day to day of the ruling prices in Calcutta?—No, we are not opposed to it; I think they know it already.

23273. But if they do not and Government favour such a scheme, your Association would not be opposed to it?—No.

23274. *Sir Ganga Ram*: Supposing some invention was brought in or discovery was made which led cultivators to grow something more profitable instead of jute, would that not affect your interest?—Yes, it would affect our interests.

23275. Is it not, therefore, in your interests to attract the growers to your side. I mean, would it not be in your interests to give them some facilities for growing jute because the profits of the growers are now becoming less and less?—I do not think that is correct. The profits last year were three times what they had ever been before.

23276. Last year was an exceptional year?—It may happen again.

23277. But supposing some discovery were made which showed them that they could grow better and more profitable crops than jute, that would affect your interests in which you have invested a huge sum of money?—Yes; we should have to turn the key of the door and get out.

23278. Do you not think, therefore, it would be wise to ameliorate the conditions of the growers to a certain extent?—No, I am afraid the jute mills will not consider that. Mills think that is a question for the consideration of Government Then you are following a suicidal policy.

(The witnesses withdrew.)

Messrs. J. Sime, J. T. Finlayson, J. W. A. Simpson and W. J. Soutar.

Mr. JAMES PEDDIE, I.C.S., Magistrate-Collector, Malda, Bengal

Replies to the Questionnaire

QUESTION 1.—RESEARCH.—I have nothing to say on this subject except that it is clear that there should be much more research if it can be financed.

The research staff is at present very inadequate and the results of research in other Provinces are not readily available. I want for example to know the result of the experiments on wheat at Pusa for introduction of improved seeds into the Malda wheat area. This is not readily available. More co-ordination seems to be required.

QUESTION 2.—AGRICULTURAL EDUCATION.—(i) There are practically no teachers of agriculture or institutions where agriculture is taught.

(ii) There is an urgent need for extension of teaching facilities in all the districts of Bengal. I know personally Dacca, Midnapore, Bankura and Malda.

(iii) Teachers in rural areas should wherever possible be drawn from the agricultural classes. Teachers belonging to the non-agricultural classes are too often afraid of soiling their hands or handling a plough.

(iv) I have no personal knowledge of attendance at agricultural institutions.

(v) As far as I have been able to gather the main inducement leading lads to study agriculture has been the hope of Government service.

(viii) I am of opinion that (*a*) nature study and (*b*) school plots help towards the end we are striving to attain and should be encouraged. I think however that (*c*) school farms if they can be developed would be a much more practical way of securing the general spread of improved methods of agriculture. In the school plot a few cabbages and brinjals are grown and neither teachers nor pupils take much interest in it as rule.

If, however, we could give teachers training at Dacca farm or elsewhere and start small farms attached to selected schools where cultivation would be on a field scale, useful lesson would be taught. I believe that the Bengal Government has approved of some such scheme but I am doubtful from what I have heard, if it will result in the spread of those school farms sufficiently rapidly.

(x) Agriculture can only be made attractive to middle-class youth by clear demonstration that it can be made to pay. We must demonstrate by running farms on a commercial basis that improved methods are paying and that labour and energy expended are well rewarded. This may of course be done by inducing keen agriculturists to run these farms on approved basis. I do not think that Government can without non-official help do this.

(xii) Adult education in rural tracts cannot be popularised by Government alone. It can be made part of the Education Department's policy that in each aided Middle English School night or evening classes should be held as well as perhaps day classes in the seasons when in a particular area there are no agricultural operations going on. This policy if adopted will, where the enlightened people in the villages lend it their support, be of great help in spreading agricultural knowledge. We require the non-official help, however, if it is to be a success. It will also be necessary to devise some system of giving to teachers in these Middle English School or High Schools some training. This scheme should in any estimation proceed *pari passu* with the establishment of school farms. The adult people will then be able to see the result in the school farm of the methods recommended and taught to the boys in the school.

(xiii) The Government of Bengal have drafted a Bill for the introduction of free and compulsory primary education. This scheme is to be financed by an education cess to be collected like the road and public works cess through the Collector. The schools will be under a district educational authority or under the education committee of the District Board. I do not know definitely, but I presume that Middle English Schools will fall within this scheme. Financing of school farms may therefore be met partly from the educational cess and partly from grants from the Agricultural Department of Government.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(*a*) The most successful measures taken to improve and influence the cultivators' practices have been :—

(1) Field demonstration :—Persuading an influential cultivator to adopt a new crop or an improved variety of seeds or to use a fertiliser recommended by the department.

(2) Distribution of improved seeds to a large number of individuals in one area, *e.g.*, jute seeds.

These methods, however, are successful only when village propaganda accompanies it, when officials or non-officials take the trouble to find out and explain to the cultivator the value of the seed, etc., recommended.

Method No. 1 has resulted in a large increase of the area under improved sugarcane.

Method No. 2 has resulted over bad areas in the adoption of improved races of jute seed.

Both methods, however, would have been much more successful if there had been a proper organisation in the mofussil through which the results could have been watched.

(*b*) I am of opinion that by properly organised demonstration and propaganda we can do a very great deal to improve the outturn immediately. The whole of the work of the Agriculture Department is being held up for lack of proper facilities for demonstration and propaganda. To take the example of Malda district. After the Retrenchment Committee's report was submitted there were two years when there was no agricultural officer in the district at all.

We have now had one District Agricultural Officer and one demonstrator for a year and the number of demonstrators is being increased to five. This staff is however absolutely incapable of tackling the question of demonstration and propaganda. There is the farm to look after. The District Agricultural Officer is responsible for that and he has little time to spare for village work.

We need some organisation through which the District Agricultural Officer can keep in touch with the actual cultivator. The mofussil has in many places now been organised for village self-government. Union Boards have been established and in Dacca, Tippera and other places are working very well. I do not see why we should not use this mofussil organisation. Why should not Government say " Our Policy is to have an Agricultural Association in every Union ". These associations may be very loose associations to start with but they will have an executive through whom the District Agricultural Officer can keep in touch with actual conditions of all crops in every part of the district. These Unions are grouped into circles under a Circle Officer who works under the Collector. The Circle Officer visits the Union at least once every quarter. When he visits the quarter he has to look into the accounts of the Union Board, to enquire into the condition of the people and the state of the crops. The leaders of the Union Board will in nine cases out of ten be the leaders of the Union Agricultural Association. Why should not the Circle Officer take an interest in the Agricultural Association and help them by reporting to the Collector and the District Agricultural Officer their needs and their difficulties? The Circle Officer also comes to headquarters every month for a conference. At that Conference, the District Agricultural Officer is present. Circle Officers can then receive instructions about the Unions they are to visit during the next month and report what they saw and heard in the Unions they visited last month. If this is to be done, it must be made part of the Collector's duty to foster these associations and it must be made part of the Circle Officer's duty. One finds everywhere that, when the District Officer takes an interest in the work of one of the " nation building " departments, the officers of that department are able to accomplish more than in other places. District Officers have had District Boards taken away from them. The routine work left is often dull. I am strongly of opinion that the District Officer should be in charge of the agricultural propaganda as well as the propaganda of the Co-operative and Industries Departments. He alone can properly co-ordinate the work of these departments. There is a good deal of overlapping and the Collector is on the spot to see that subordinates are doing their duty. In mofussil subdivisions the work will be done of course through the Sub-divisional Officer. I feel most strongly that if progress is to be made we must organise the mofussil. To do this Government must take the lead and if this is done non-official agencies will soon spring up to relieve Government of the task. At present, however, Government must undertake the work and the best means I can suggest is that detailed above.

District Agricultural Associations are usually run by busy pleaders who meet once a year to discuss the budget and the policy but who do no real work. Once however we can get the actual cultivators to take over the associations, I am sure that Government will soon be able to hand over the work to non-official agencies, and, as the Circle Officer has come to stay, Government will always be able to take a friendly interest in the well being of these associations.

3. (*c*) The only method by which cultivators may be induced to adopt expert advice is by intensive propaganda and by demonstrating to them that the expert

advice is sound and profitable. When once the cultivator has confidence in a particular variety of seed or a particular method or even in a particular officer, results always follow. We must win their confidence. That can only be done by getting into close touch with them.

QUESTION 4.—ADMINISTRATION.—(*c*) (*ii*) *Railways and Inland steamers.*—These on the whole, I think, meet the present demand for facilities for removal of agricultural produce. A very great deal of the inland transport is of course by country boat which is cheaper than rail and steam-ship transport.

(iii) *Roads.*—The roads in many parts of rural Bengal are hopelessly insufficient. The roads in Malda district are particularly bad, and the District Board does not have the money to tackle the problem. With the new developments in public health and sanitation the District Board finds that it cannot even repair its roads once in four years and new construction is almost out of the question. There is now also a growing public demand for motorable roads, but at present I see no hope of satisfying that demand without a very large increase in the income of the District Board. There should, I think, be a Road Board of some kind to govern the road policy of the Province. Extra taxation must also be imposed, *e.g.*, a cart tax —the whole of the proceeds of which should go to the roads. Road repair is very necessary.

(*v*) *and* (*vi*) *Post and Telegraphs.*—As far as my experience goes, I find that the Postal Department is willing to consider favourably any application for extension of facilities when there is a case at all for the granting of these facilities.

QUESTION 5.—FINANCE.—With regard to loans to cultivators I think that the only sound method of financing them is by the extension of co-operative societies of various kinds but I think that for propaganda purposes a much fuller use of the system of *taccavi* might be made.

(*b*) The Agriculturists' Loans Act is practically a dead letter. In many districts it is very seldom indeed that applications are received. Most of the cultivators know nothing about it at all, and many of these who do know about it do not apply because, they say, Government always demands the money at the time fixed for repayment. An extension of the time allowed for repayment is, they say, difficult to obtain. Very much more use could be made of these agriculturists' loans and very much more good work could be done with their aid provided the grants were made to subserve the Director of Agriculture's programme of propaganda.

If we are to have an Agriculturists' Loans Act it seems to me that part of the money at least should be at the disposal of the Director of Agriculture for the financing of his scheme for the propagation of new crops in areas where they are not grown, for the spreading of improved varieties of seeds, and for the supplying of manure.

One finds that many cultivators are quite willing to set apart land for trying a new crop or a new manure but they are unwilling to pay cash for the seed. They will agree to repay at the time of harvest.

If the Director of Agriculture had part of the money available for distribution as agricultural loans at his disposal, he could do six times the amount of work that is done at present to increase the yield of jute, paddy, sugarcane and the other crops of which improved varieties have been produced in the Government farms.

If Government so desires, the money may be distributed through the Collector to persons whom the Collector considers to be fit to receive it and it may be collected through the loan collection department of the Collectorate.

If the money necessary for properly financing the schemes of propaganda is not readily available, I do not see any reason why Government should not raise a loan for the purpose. At present as far as I know (I may be wrong) money lent under the Agriculturists' Loans Act comes from current revenues. I do not think that this is necessary or desirable. Cultivators will take these loans far more frequently if they know of the possibility of getting them and if the law is not too strictly administered. There is provision in the existing law for granting time for repayment in the event of failure of crops, inundation, etc.

QUESTION 6.——AGRICULTURAL INDEBTEDNESS.—In my opinion (*i*) the main causes of borrowing are :—

(1) The frequent failure of the crops especially in one crop areas like the *barind* of Malda and Dinajpur and over considerable tracts of districts like Bankura, Birbhum and Midnapore.

(2) Bad social customs—especially the dowry.

The sums that are paid by all classes of ryots and middle-class *bhadralog* are far beyond their means. The poorest cultivator in this district now pays 40, 50, or

60 rupees as *pon* and I am informed that the same is the case elsewhere. In the Government *khas mahal* area of Malda district a landless cultivator often pays 100 or 150 rupees and a cultivator with 15 *bighas* 250—300 rupees to marry a daughter. This has often to be repaid by binding himself or his sons to serve the moneylender for his or their food for a period of years. Fifteen or twenty years ago, this was not so and the rate is increasing year by year out of all proportion to the increased price of commodities. Among certain classes, *e.g.*, the Poundra or Puneri Kshattriyas who are silk-worm rearers in this district and the Goneshes who are pure cultivators, money has to be paid for the girls, to get rid of them by marriage. A silk, worm rearer will often pay Rs. 2,000 for a wife. The rate is Rs. 100 per year of the girl's age.

(3) *The habit of borrowing.*—There is little saving among the cultivators. When they get a good harvest they spend all the surplus on luxuries or on additional plough oxen with the result that when they get a poor crop they have to go to the moneylender.

(4) *Ignorance and lack of education.*—I find that lack of education has been one of the main causes of indebtedness of many cultivators, particularly among aboriginal tribes. They are a prey to any one who has a little money to lend. There are a number of men I know who now rank as zamindars who twenty or thirty years ago were nobodies. Their wealth has been made by lending money at exorbitant rates to illiterate cultivators, who did not know what sort of a document they were signing. The area occupied mainly by aboriginal tribes is in the district of Malda in the neighbourhood of 800 square miles and this land is fast passing out of the real cultivator's hands.

(5) *The ridiculously high rates of interest charged.*—37½ per cent is the usual rate and even if compound interest is not always realised it is usually entered in the mortgage that interest will be compound.

When seed is taken and repaid in kind the interest is very excessive. In the *barind* the cultivator takes paddy for seed and for food on the *dheria* system, *i.e.*, at the next crop he returns 1½ times the amount received.

In the Government *khas mahal* area the state of affairs is worse. There the *duna* system prevails. If I take 10 maunds of paddy in July, in December, repay 20 maunds. If it is not paid, then I am liable to pay 30 maunds in March, and if not paid then 37½ maunds in July. If I still fail to pay a mortgage is executed, the consideration money being 37½ maunds converted into cash at the market rate and interest will be charged at 37½ per cent. on that. The result of this iniquitous system has meant that whole villages of people have lost all their lands even their homestead lands.

(6) Documents such as the *Sudbhondhak* by which the cultivator gives up his land to the lender till he can repay the capital. I presume that this is the kind of document referred to in Questionnaire as an interminable mortgage.

(ii) Practically the only sources of credit of the cultivator are the village *mahajans*. The co-operative societies, although in certain area they have succeeded in reducing the prevailing rate of interest, have so far only touched the fringe of the problem.

(iii) The reasons preventing repayment seem to me to be mainly :—

(1) Failure of crops especially in one crop areas.

(2) The habit of postponing payment which is a very common habit and results in many cases in the failure to pay interest and the increase of debt till the cultivators' lands are sold by order of the Court.

(3) The fact that moneylenders often take advantage of the cultivators' disinclination to pay, give them an extension of time for payment, till, with the accumulated interest at high rates, the cultivator is doomed and he loses his land.

(4) *Borrowing beyond means.*—This often happens among cultivators and the readiness with which money is obtained helps to encourage this.

(*b*) *Measures for lightening agricultural burden of debt.*—(1) First and foremost of all we need universal primary education.

(2) Second, we need social reforms. For that a social reformer who will grip the people and carry them with him is required. Many educated Indians profess disagreement with bad social customs, but few seem to break away from these.

(3) The Civil Courts are very often rich men's courts. In many cases I have advised cultivators to take real grievances to Court to have them righted and in the majority of cases I have been told, I have not the money to go to Court. I must do without justice. In many cases summons are not served on the person or the person on whom it is served is so poor that he cannot appear to defend himself. The result is an *ex-parte* decree which is in money suits tried by the Small Causes Court Procedure usually decided by the Munsiff according to the plaint. Munsiffs are as a rule busy. They may have 30 *ex-parte* decrees to make

in a day. They say they have not time to go into uncontested cases. The fact remains, however, that in these cases not nearly enough use is made of the Usurious Loans Act.

Many holdings are sold in execution of *ex-parte* decrees which might have been saved had justice not been so difficult to obtain in our Courts of law. The really poor man has little or no chance of gaining the day. It is difficult to see what can be done except to insist on a much more strict interpretation of the Usurious Loans Act. I shall refer to this again in paragraph (*b*) of this section.

(4) Non-terminable mortgages should be prohibited by law. Among ignorant tenantry in certain areas they have worked in credible damage. I know of many cases personally especially in the Gomasthapur *thana* of Malda district.

(*5*) I have already suggested that the Usurious Loans Act should be much more strictly enforced. Munsiffs complain that the provisions are too vague and if they enforce them rigorously the only result is an appeal which is allowed, and, that Munsiffs naturally wish to avoid. I know of Munsiffs also who hold that 37½ per cent is a low rate of interest. This rate is the average minimum charged in the Malda district—usually compound interest. I have found documents where the interest was between 50 and 60 per cent. compounded every three months. When paddy is taken in kind for food or for seed the cultivator borrows the paddy in July and returns the same amount *plus* 50 per cent in kind in January. If he fails to pay, the number of maunds is converted into its cash equivalent and a mortgage is taken for the amount. This is the custom in the *barind* high land area.

(6) I think that there should be much more control of the village *mahajan*. Some means should undoubtedly be devised for limiting the rate of interest charged. The illustrations I have given already are sufficient to show how impossible it is for a cultivator to save himself if he once gets into debt. Registration of moneylenders with a system of licenses might be introduced. If this were done and if Government could do something to limit the exorbitant rates now charged, much good would result. If licenses had to be taken and if *mahajani* accounts were open to inspection moneylenders in villages would be more careful.

(7) The only really final methods of lightening agriculture burden of debt are (*a*) the hastening of the extension of compulsory primary education, (*b*) intensive propaganda in the villages both agricultural and co-operative and endeavour to cover the country with co-operative societies as early as possible.

(*c*) It seems to me to be dangerous to try to limit the right of the cultivator to mortgage or sell his land.

This has, it is true, been done in the case of certain aboriginal tribes like the Santals and the results are satisfactory as far as one judges after a two years' trial. In practice, however, this law is found somewhat difficult to administer properly. There is also the danger that if we limit that right to mortgage and sell we may make it far too difficult for the cultivator to get money which is essential for his cultivating of the soil.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—(*a*) *Remedy for excessive sub-division.*—The remedy seems to be to amalgamate and the only satisfactory method is the co-operative method.

(*b*) Obstacles in the way are both sentimental and practical: (1) the sentimental obstacle is the love a cultivator has for his own piece of land. He knows what it can do and he hesitates to exchange it for another even though the exchange will help him.

(2) The chief practical obstacle is the fact that in so many areas non-cultivators and non-residents are the ryots and the old original family of cultivators have sunk to the level of the "*korfa*" or under ryot paying "*adhi*" or "*borga*" at harvest time to the non-resident non-cultivating ryot.

(3) Dissentients in the village. To deal with these and with the non-resident ryot powers should be taken to compel them to join when the majority of the villagers desire to amalgamate their holdings through co-operative societies.

QUESTION 8.—IRRIGATION.—There is much irrigation to be done in Malda district and in Dinajpur district as well as in other districts of the Province. We can accomplish far more for agriculture by irrigation than by any other means. I have already suggested to the Irrigation Department two comparatively large schemes and eight or nine smaller schemes in Malda district. The Irrigation Department started last year and are engaged now in the task of collecting hydraulic statistics.

There should be an irrigation sub-divisional headquarters in Malda. There is enough work in Malda district alone to justify the opening of an irrigation sub-division there.

Mr. James Peddie.

There are two main areas where irrigation or flood control or both are required—one area is the *barind* the high land in the East and the other is the *tal* which lies in the West and the North-West.

The *barind* of Malda covers about 800 square miles. It also extends a long way into Dinajpur. It gives one crop per annum—winter paddy. The rain comes either too late or too early or both. For the last five years the crops in the *barind* were roughly :—

1926	...	... 4 annas (probably)—not yet reaped.
1925	...	... 4 to 5 annas.
1924	...	... 16 annas.
1923	...	... 4 annas.
1922	...	... about 8 annas.

This area when the rain comes at the right time bears a heavy crop of paddy and large quantities are exported to Bihar and East Bengal. At one time during the Mahommedan period the *barind* was highly cultivated. There are hundreds of old tanks which must have been used for irrigation. These are now nearly all silted up. We might start the work of re-excavating these old tanks through co-operative societies if the Santal inhabitants were not so ignorant. One may go twenty miles without meeting a person who can read or write. The correct manner of dealing with the area would be as a whole and to do this the rivers Tangan and Purnabhaba might be utilised by damming the water in the upper reaches of the valleys and by bringing it down by high level canals along the main ridges. The country is undulating and the undulations would probably lend themselves to such a scheme.

Apart from the *barind*, there is a large *tal* area twenty miles from north to south by 10 to 12 miles broad. This area floods deeply so that in most years paddy and jute are drowned out. When the rains stop the water drains off at once and the land dries very quickly, the result being that though the soil is excellent soil for wheat, in four years out of five the rabi crops fail for want of water. This area is essentially a wheat and oil-seed growing tract and it is at present a vast waste of jungle with a few patches of cultivation here and there. If we could supply water in the cold weather and the hot weather, it would bear excellent crops. For this it would probably be necessary to use the water of the Mahananda which would be admitted through sluice and brought down by canals. Enquiries in the area are now going on and should be hastened as far as possible.

Apart from the *barind* and the *tal* there remain large *bhil* areas where much good arable land might be reclaimed by flood control and drainage. These questions which are also intimately bound up with the health of the people (Malda is very malarious in certain years) cannot be properly tacked unless an officer is posted here.

I think that by irrigation we can do more at least in West and North Bengal than by any other form of activity for the benefit of the cultivator.

(*b*) The obstacles in the way of extension of irrigation are :—

(*a*) *Lack of knowledge.*—The Irrigation Department has only just begun its general enquiries in North Bengal and it is not in a position to advise the local authorities. More general hydraulic statistics are necessary.

(*b*) *Lack of staff.*—There are many calls on the Irrigation staff which is insufficient.

(*c*) Large rivers are undoubtedly very important but I think that the Irrigation Department should devote more time to purely agricultural irrigation schemes.

(*d*) *Finance.*—Government is not the owner of the soil and the results of irrigation schemes do not react on Government revenues as they do in certain other Provinces.

(*e*) Zamindars are indifferent or conservative. They are mostly too busy collecting rents to worry about permanent improvement of the land by irrigation. Were Government the zamindar money invested in the land would be a very profitable investment. It is difficult to get private zamindars to see this.

(*f*) The Agricultural and Sanitary Improvement Act has not yet been properly tested. Most of the officers of the Irrigation Department object to it on the ground that the assessment of benefit derived especially in schemes of flood regulation and control, is very difficult—I mean schemes where flood water is kept off a certain area till certain crops are reaped, then gradually fed on to the land as the young crops rise and at the end of the rains, gradually let off so as to retain moisture in the soil for the longest possible period.

(*g*) I think that the present legislation is not quite sufficient for our needs.

QUESTION 9.—SOILS.—I cannot say much about this except that where as a few years ago the tops of the ridges in the *barind* tract of Malda used to be covered with scrab jungle and *sal* forest these have now been cleared. The result is that from the top of the ridges there is much washing away of surface soil during the rains.

These should either be planted regularly with crops like *arhar* or in my opinion better still replanted with *Sal.*

The trouble is that all these lands have either been let out by the zamindar to tenants or have been occupied by tenants without the landlords' permission.

The same state of affairs exists in parts of the highland of Bankura and of Midnapore.

QUESTION 11.—CROPS.—(*a*) (*i*) *Improvement of existing crops.*—Much is possible by persuading the cultivators to introduce new varieties produced on Government farms whose yield is higher. More research will enable us to deal with a larger number of crops. At present, we have mainly jute, sugarcane, tobacco and several paddies. The work on paddies is not nearly finished but before long we shall have completed the introduction of jute as recommended by the Department. Much remains to be done on *rabi* crops and the results of the work on these in other Provinces should be made more readily available.

Much more also could be done to improve existing crops by (*a*) irrigation (separately dealt with) and (*b*) better manuring. For the latter more propaganda is required. Unless we get the staff and create the organisation, work will be very slow and much effort will be wasted.

(2) *New crops including fodder crops.*—Here also much is possible in certain areas. Tobacco and sugarcane can be grown over large tracts in Malda district where none is grown now. To effect this improvement, supply of seeds, village propaganda, and mofussil organisation are required. At present we could sell much more tobacco and sugarcane of recommended varieties than can be supplied to us. There is every chance that these new crops will soon establish themselves.

Fodder crops.—The need for fodder crops is beginning to be recognised in this district and with staff for village work the cultivation of fodder crops could be rapidly extended. Many of these problems could be solved if we had the money to tackle them.

Distribution of seeds.—(*iii*) The Agriculture Department cannot tackle this question alone. It must have help. It can produce new varieties and say how they should be grown. It can give the new varieties a start: but multiplication and distribution should after the initial stages be done by non-official agencies.

These, I suggest, should be non-official seed farms registered by the department and to a certain extent supervised in order to avoid mixing of good and bad seed. If the seed is good, it will soon spread and when once it has covered an area the seed supply problem will solve itself as local agents will undertake the supply. As has been done in the case of jute responsible agents may be appointed for the collection and sale of seed guaranteed by the Department. If the local Agriculture societies I mentioned in paragraph 3 are formed they may form a link in the chain which ends in the cultivator. One difficulty must be faced, *viz.*, the fact that most cultivators dislike paying cash and if they can get the poorer seed on credit they will probably take these in preference to the better seed. We must therefore try to enlist the support of certain recognised local seed suppliers. Co-operative seed supply societies may in time be formed but it will be a number of years before these can be of much real assistance.

(*c*) *Successful efforts in improving crops.*—Fifty per cent. of the jute now grown in Kharba *thana* of this district is *kakia bombai* jute which yields a much better crop than the local varieties.

Government jute is also spreading in other *thanas* and the demand is increasing in these areas also. Work on jute will soon be finished in this district except for occasional renewal of the supply of pure seed.

Dudsar paddy is now established in Gajole *thana* and would now be fairly widespread in other *barind thanas* were it not for the fact that for the last two years there has been a failure of the *barind* crops for want of late rains. This year about twenty *dudsar* paddy seed farms were started in the *barind.*

Potatoes have been established in Kharba and Harischandrapur *thanas* and in Kharba the cottage garden habit is now almost universal.

QUESTION 16.—ANIMAL HUSBANDRY.—I do not know much about animal husbandry but there are one or two facts which I would like to mention.

Land is let out as arable land to tenants irrespective altogether of the necessity for retaining pasture lands. The result is that over very wide areas there is no

pasture land and no land for exercising the cattle. In the *barind*, the habit is to allow cattle to graze over all the fields from December to July. During this period there is practically no grass even on the *ails* or ridges between the fields. It is all brown and dry. The cattle get little grazing, and, as there are no fences, it is impossible to grow a second crop, *e.g.*, maize. In the rains most of the land is under paddy and there is not even exercising ground for the cattle. Near the river valleys there are large *bhils* or marshes where villagers often take their herds for the dry season. These however are fast coming under the plough and with the extension of irrigation and flood control the available pasturage will shrink still further. The villagers all complain that the supply of milk is getting worse and worse from year to year and the price is continually going up.

Over large areas there is much overstocking of available pasture land. No attempt is made to control breeding or to improve the stock. The village bull is of a very poor type and the cows are on the average so small that the bulls from the Rangpur Government Farm herd are too heavy for them.

There are no enclosed pastures. Without village propaganda and education we shall be unable to influence villagers in this direction.

There are periods all over the district, which vary with the type of land, when dry fodder is scarce.

I have noted above that there is great scarcity of green fodders at certain seasons. In *bhil* areas it is when the *bhils* are under water, and on the high land area chiefly when the sun has dried up all the grass, *i.e.*, from February to June. I have had requests from villagers in different parts of the district that arrangements should be made to ensure protection of pasture land. It is difficult to do anything, however, for most of the landlords take no interest in the question and are far too anxious to get the *salami* and the rent to worry about grazing.

The question is a very important one especially in its bearing on the milk problem which seriously affects the whole population.

The only solution of the fodder question seems to be in the cultivation of fodder crops and the development of the system of storing in silos. Here again education and propaganda are essential.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(*a*) The average cultivator in the *barind* one crop area of Malda district does about from four months' work altogether during the year, in some cases less than that. In *diara* or riverside areas where a variety of crops are grown the cultivator works for from six months to nine months every year. The cultivator in his slack time does nothing at all.

(*b*) I can suggest no means for encouraging the adoption of subsidiary industries except the continual preaching of the necessity of adopting these industries and the persuasion of as many individuals as possible to adopt them. Government alone cannot do it. Non-official help is essential and in these matters in the average district one gets very little non-official help. Among the Sonthals, Rajbanshis, and Droons of the *barind* Government might establish weaving as a cottage industry and efforts in that direction are being made. The cultivators there, however, especially the Sonthals have become very lazy and if they can get enough to eat they will not take the trouble to work. More education is required. There are only between twenty and thirty primary schools in an area containing over a lakh of people and these schools have from ten to twenty pupils each.

Demonstration parties are a useful means in areas when the cultivators are a little more enlightened and Government should maintain as many of these as possible. The work of these parties is hampered if the district authorities do not co-operate and fail to do what they can to bring the cultivators to the demonstration.

The necessity of subsidiary industries should be taught in all schools. We need not hope for a sudden change but by using all the means at our disposal we may in time teach the cultivators as a whole that they can do much to help themselves by being a little more industrious.

(*c*) The obstacles in the way of expansion of the industries mentioned in the Questionnaire are :—(1) indifference of the cultivators themselves, (2) lack of effort on the part of the educated people to interest themselves in propaganda towards this object, and (3) caste prejudices and old customs in such industries as poultry-rearing which the Hindus will not adopt, and basket making which is done almost entirely by *Doms* who belong to the lowest grade of society.

I append notes on the industries which have fallen within my own experience (*vide* Appendix).

(*d*) Government should, if possible, do more towards the establishing of small industrial concerns in rural areas. Apart from the fact that they will bring the market nearer to the door of the cultivator and will assist in the elimination of the middleman who absorbs so much of the profit.

(*e*) Communications are in many places so bad that it would, I think, be difficult to persuade the large concerns to migrate to rural areas.

(*f*) More extensive study of each rural industry is very desirable. By the starting of Industrial Unions and sale and purchase societies as well as by the introduction of improved tools and implements much good work is possible. The difficulty lies in arranging for proper management and supervision.

I asked the Industries Department for a simple cottage machine for finishing and burnishing brass and bell-metal articles eighteen months ago. I have not yet got it.

(*g*) I can suggest no other methods of increasing rural employments than those already mentioned.

(*h*) The only way to induce the people to improve the health conditions of their environment is by education and by introducing co-operation. In a village of 300 people where 100 died in four months of malaria and where the children were still dying almost daily it was with the very greatest difficulty that they could be persuaded to allow the health authorities to cut down the few bamboos that were keeping the sun off the insanitary ditches where the mosquito was breeding. If that is the case in such circumstances, the difficulty where epidemics do not prevail can easily be imagined.

QUESTION 22.—CO-OPERATION.—It is with some hesitation that I write about co-operation. Without the extension of the co-operative movement among agriculturists it would seem to be impossible to make progress in the practice of agriculture; but on the other hand there is not an urgent demand from the people for co-operative societies and without the support of the general public the Co-operative Department cannot extend. Up to the present co-operative work except for a few societies here and there, *e.g.*, the Industrial Union in Dacca, Jute Purchase and Sale Societies in Serajganj and others, has been mainly concerned with credit societies financed through Central Banks. These associations have to a certain extent fulfilled their object inasmuch as they have succeeded in many places in reducing *mahajani* rates of interest and in freeing their members from debt. I feel, however, that if full use is to be made of the Co-operative Department for the improvement of agriculture we must go much further than credit societies and start societies with limited but definite agricultural objects.

I have talked about this with Directors of Central Banks who are usually busy Pleaders. The answer I invariably get is "We know all about lending money, banking *mahajans* but we do not know about buying and selling crops, looking after seed stores, etc. If you want to do that it will have to be done by a separate organisation." In this district a year ago two new Central Banks were started. They are the "Chanchal Raj Central Bank" and the "Harischandrapur Central Bank." These two banks are to all intents and purposes, Zamindari Central Banks run on co-operative lines. The zamindars of Chanchal and Harischandrapur have between them undertaken the co-operative development of three *thanas*. They are adopting a definitely agricultural policy and instead of the ordinary Credit Societies they propose to start tobacco societies where we want to introduce tobacco and sugarcane societies where we want to introduce sugarcane, etc. They will combine the work of the ordinary credit societies with seed-supply. Where one can get zamindars who are really interested in the tenants this is undoubtedly a good type of bank, but there is of course the danger that with a change of management such banks might not be run entirely for the benefit of the ryot. More Central Banks of this type might be started. Far too many of our Central Banks have developed into dividend making machines. If the existing Central Banks cannot undertake the work how is it to be done? I believe that if we start Agricultural Unions financing rural societies of various kinds such as those enumerated in the Questionnaire the benefit to the agriculturist would be greater. The problem is how to start these Unions and how to look after them. Is Government to do it or are non-official agencies to do it? The answer is that, if Government does not show the way, nothing will be done at least for some time to come. However much people may object to interference by Government Officers, I do not think that we have at present any non-official agency which will take this up.

Non-official agencies will be found to help and I think that the money will be forthcoming, but if the work is to be done Government must show the way.

(*b*) *Credit Societies.*—Many of these have been very successful. Many others have failed. The failures are very often the result of slackness and lack of supervision. One reelers' society in Malda has fallen into a bad condition because the Central Bank though it lent large sums of money did not properly supervise the society and much of the money was spent on other kinds of trade and not for

the reeling business for which the loans were given. I hear the same tale regarding other societies from co-operative officers.

(*ii*) to (*ix*) *Purchase and other societies.*—I have no experience of these. There is however a large field for purchase and sale societies provided we can get the agriculturists themselves and the landlords to take up this form of co-operative activity. We require those interested in the land and the land worker at the head and not the busy pleader who cannot devote enough time to the work. The same remarks apply to the other types of societies mentioned. It will not, I fear, be possible to start societies for joint farming at present. The cultivators have not enough education to see the value of it, but it is only by forming such societies after amalgamation of holdings that proper use can be made of scientific implements and tools.

(*c*) I am of opinion that when co-operative schemes for joint improvement cannot be given effect to because of the unwillingness of a small majority to join that legislation should be introduced in order to compel such persons to join for the common benefit of all.

(*d*) On the whole, the societies of which I have experience have achieved their object. In a village, however, where there is a co-operative society one finds that it is only the more well-to-do cultivators who are members. They have not been able to help those most in need of help.

Seed societies where the return can be taken in kind will benefit a far larger number of people than the ordinary credit society and such societies will be introducing nothing new, for the *mahajan* takes his paddy back *plus* interest at the time of harvest.

Note.—The Co-operative movement is at present financed by the Provincial Bank. It is proposed to start a separate Industrial Federation in Calcutta to finance Industrial Unions. It seems to me that if there were a Provincial Agricultural Federation, co-operation in agriculture would spread more rapidly. In the same way in the Department there are ordinary Inspectors who deal mainly with credit societies. These officers have little or no interest in agriculture. Recently the number of Industrial Inspectors has been increased. We should have Agricultural Co-operative Inspectors also working in very close touch with the Agriculutural Department whose duty it would be to form and look after purely agricultural co-operative societies. The Co-operative Department would then have three main branches—ordinary credit, industrial and agricultural.

There is so much overlapping of agricultural, co-operative and industrial activities that one head for the direction of work among the people seems to me to be desirable. In other words I think we should have a Development Department in which activities of agricultural, co-operative and industrial officers might be co-ordinated.

QUESTION 23.—GENERAL EDUCATION.—(*i*) and (*ii*) At present the training given in high schools and middle schools is of no assistance whatever in the raising of the standard of agricultural efficiency. If a boy who is a cultivator's son has read up to the standard of the middle English school, he becomes dissatisfied with his hereditary profession and wants to become a clerk. It is pitiful to meet a very large number of youths who have read up to the Matriculation standard who admit that they have been sitting at home idle doing nothing for one year, two years or three years, waiting for some job to turn up. These, too, are very often cultivators' sons who might be helping their fathers. We want to educate our cultivators' sons up to the middle school standard; but unless something is done to alter the course of study, the education is largely wasted as far as agriculture is concerned.

(*iii*) *Elementary Education.*—The Primary Education Bill has already been referred to. There is a considerable demand from the people for primary education and the sooner we can get compulsory primary education the better. There are far too few schools now. Elementary education, good elementary education, is absolutely essential if any of our agricultural problems are to be solved.

(*b*) (*i*) It has already been noted that middle schools should all have school farms attached to them as early as possible and that agricultural education should form an important part of the curriculum. I have also suggested that the institution of adult classes should proceed *pari passu* with the establishment of school farms.

(*ii*) I have no experience of compulsory education in rural areas.

(*iii*) The explanation usually given for the small proportion of boys in rural areas who pass the fourth class is that their parents are too poor to keep them at school. This I do not believe to be true in many of the cases where this explanation is given. What often happens is that the boy plays truant, the parent is fined and at once withdraws his son from the school. If the boy does not play truant he is

kept at home to herd the cattle in which case the parent is fined, with the same result. Most often, however, the boy is kept away because his father wants his help in the fields or as a herd. The fees are such that with a less expenditure than the expenditure on *pan* and tobacco the children can get primary education. I have put the *pan* and tobacco proposition to many cultivators and they have usually admitted that what I said was true, *viz.*, that the fees were less than the cost of their *pan* and tobacco.

QUESTION 24.—ATTRACTING CAPITAL.—(*a*) Profits from moneylending are so great and the return is so sure that as soon as a man is in a position to invest money he at once lends it out at interest and thereafter keeps it out at interest. If he has to foreclose, he often buys up the land but here again profit is so easily made without his taking the trouble to farm that he adopts the easy course of admitting the late ryot as his *adhidar* or of putting in another *adhidar*. He supplies seed and at harvest time gets half of the crop. I know one man who has acquired 4,000 *bighas* in this way. Practically all his cultivation is through *adhidars*. This applies also to most of the zamindari *kamats* or farms in the zamindars own possession and to a very large numbers of the *talukdars* and *jotedars*. In the district of Malda, there are a very large number of persons holding 100 acres and upwards. Few of these farm the whole of their lands although there are many of them expert cultivators and are willing to adopt new methods.

As long as money is so easily made by moneylending it will be difficult to get men of capital to take to farming. The successful cultivator who makes money also very soon becomes a moneylender.

The only way to induce men of enterprise and capital to take to farming is (1) to make it less easy to make money by moneylending, (2) to demonstrate the possibilities of scientific agriculture and (3) improve the land by irrigation, etc.

(*b*) I cannot understand why owners of land do not carry out improvements. The only reasons I can give are :—

(*i*) That most owners of land are, like their tenants, not sure of the results of a proposed improvement. I have consulted a number of zamindars with regard to irrigation schemes. They say " if you can do that it will be good for us and also good for the tenants and we are prepared to pay our share." They have not however the initiative, knowledge and enterprise to carry out these schemes.

(*ii*) Many of them, the majority, take no interest in the land at all as long as their officers collect enough money from the tenants. The conscience of the landlords—not of all but of many of them—must be awakened to the duties of the landlord to his tenants and to the State. He must be made to realise that it is not enough to pay his revenue regularly before sundown on the last day of the *kist*. If he does not awaken soon, I think that the awakening he will get at the hands of his tenants will be a rude one. There are still many zamindars whose zamindari papers and maps are in hopeless confusion who are, along with their tenants, a prey to their officers, zamindars who even now give the *mahals* to the *gomostha* who can advance beforehand the largest sum of money. Education of the small zamindar is as necessary as education of the ryot.

QUESTION 25.—WELFARE OF RURAL POPULATION.—In districts like Malda, the rural population suffer much from malaria. This is caused by insanitary conditions. Every District Board should have and enforce bye-laws for the removal of the insanitary conditions so that, if a villager or villagers refused on notice being served to make their village sanitary, the District Board through the Health staff might carry out the work and realise the cost from the inhabitants. Such bye-laws exist in all Municipalities and should form part of all District Board books of bye-laws.

(*b*) District Boards should be encouraged to take loans for the improvement of rural water-supply instead of carrying on the work at the present rate of progress out of current revenues. Powers should if possible be taken for recovery of part of the cost of supplying water from the villages which benefit.

(*c*) I think that economic surveys in typical villages are very necessary. One hears so many opinions about the economic conditions of the cultivators that it is extremely difficult to say what steps are required in a particular area without such enquiries. The enquiries may be carried out through the staff of the District Officers as and when the District Officer is able to spare an officer for the work. Much useful information may be collected at the time of settlement operation.

(*d*) In the sericulture department such enquiries are going on and I append the results of these enquiries in one or two villages as well as certain broad deductions from more extended enquiries over one-third to one-half of the total silk producing area in Malda.

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I did not expect that I would have to reply so early to the questionnaire, so the enquiries I am having made in one or two villages inhabited by ordinary cultivators have not yet been concluded.

QUESTION 26.—STATISTICS.—As long as the education is in its present state I do not see how we can improve the method of collecting agricultural statistics. We must rely to a large extent on the village *dafadar* and *chowkidar* and these statistics are bound to be very uncertain for some time to come.

(*b*) Under the heading, I would like to suggest that market prices of agricultural produce in the various markets if it could be circulated in print regularly for posting in police stations, sub-registry offices and on the notice boards of other offices would help in the education of the cultivator. If we do not begin to supply such information, the cultivator will continue to be robbed by the middlemen.

APPENDIX

Note A

1. *Sericulture.*—I write separately about sericulture as it is one of the most important subsidiary occupations of cultivators in certain parts of Bengal and over large tracts in the districts of Malda, Murshidabad and Birbhum, is the main occupation of many people of the cultivator class.

Up to the present the industry has not been properly organised. Government have certain nurseries producing disease-free seeds. Over most of the area where Government seed is purchased, the seed is put into disease infected houses and ruined. If, therefore, the maximum effect is to be gained from Government scientific culture of seeds the cultivators must be taught improved and hygienic methods of rearing silk worms. Government have sanctioned a number of officers for this financial year for village work. It will take several years before this staff can be safely dispensed with and the industry left to itself. The industry is said to produce in Malda district alone 1,50,00,000 (one and a half crores) of rupees worth of thread each year. Most of this is consumed in India.

2. *Research.*—This is necessary to improve indigenous races and also for the production of new races which will be more resistant to disease and which will yield a larger percentage of silk.

3. *Sericultural Education.*—At present there is a Sericultural School in Rajshahi. The Collector of Rajshahi and the Director of Agriculture both agree with me that that school should be removed to the Malda district and attached to the Piasbari nursery and proposals will probably be put before Government asking that this should be done. This school produces selected rearers. These selected rearers are some of them *bhadralog*, and some of them professional rearers' sons. When they have passed the examination they are at present given a reward by Government of Rs. 250 and are required to build a rearing shed of the approved type and to produce seeds for a period of years, failing which the reward may be demanded back. I have proposed that instead of granting a reward of Rs. 250 that a loan of Rs. 800 should be given. Rs. 250 is far too little and the result is that the young seed rearer has often to saddle himself with debt to a *mahajan* at the start of his career. If he had a Government loan it might be given interest free for three years and if not paid within that time interest at 6¼ per cent. might be charged on the sum still to be paid. If *kists* were regularly unpaid the money might be realised either from the ex-student himself, if he has land of his own, or from his surety who would be responsible for his carrying out his contract.

The outturn of trained seed rearers should be increased with the object of relieving Government as soon as possible of the burden of production of seed on a commercial scale. As early as possible the Sericultural Department should be producing only the seed necessary for " selected rearers " who should produce all the seed required by silk-worm rearers in the Province. The students of the Sericultural School, Rajshahi, know theory but fail in practice. For that reason the school should be attached to a large nursery where the students can do the actual work.

Apart from the sericulture schools a certain number of rearers' sons are taken on to the farms as labourers. They get accommodation and labourer's pay and they do the work of the nurseries, both rearing and cultivation, learn the improved method and go home trained. Some of these become selected rearers and the others return home to introduce to their own village the methods they have learnt.

Demonstration and propaganda.—This is very necessary if the industry is to be put on the right lines. I have noted above that until a short time ago disease-free seeds were being put into disease infected houses and Government were blamed for producing bad seed. In addition to this the cultivator frequently gets only a six anna crop because he has had the rest destroyed by flies. This can be avoided by seeing that his rearing shed has all the holes filled up with mud and doors and windows fitted with wire gauge. Without village to village propaganda it is impossible to get this done. With such propaganda it has been found in Malda that it can be done and the results show that it is very profitable for the cultivator who is pursuaded to take the advice of the departmental officers. I append a statement regarding certain villages where propaganda has been carried out.

Another cause of loss to the cultivators is disease. The cultivator does not know what to do when disease appears and often before it is reported the disease will go right through every rearing shed in the village whereas had the cultivator

reported the epidemic of, say pebrine, it might have been checked by disinfection at the outset. If this is not taught to the cultivator, the heavy losses which are quite unnecessary will still go on. For this purpose also the staff for propaganda is required.

At the present moment these officers are engaged on the compilation of certain statistics as well as in the assistance of the cultivators in the fight against silkworm diseases. These enquiries show that in the last ten years there has been little change in the amount of land under mulberry. The decrease is under 5 per cent and is mainly due to the substitution of jute for mulberry in the *diara* or river side lands. They also show that though there is a great deal of debt the cocoon rearer class as a whole is not very badly in debt. In other words, inspite of the drawbacks under which he is working, he is making a living though it is a poor one. Statistics relating to one or two villages are given below.

I also append a statement showing increase and decrease in mulberry cultivation over one-third of the silk area.

Marketing.—The complaint one hears on all sides is that the market is poor. The rearer sells cocoons to the reeler who prepares the thread. The rearer cannot afford to wait for the market. He must sell or the cocoons will be spoiled. He must therefore take what the reeler is prepared to give and that is largely dictated by the Marwari middlemen who advance money to the reelers and take and export to various parts of India the thread they prepare. This brings us to the marketing side of the industry which can I think be very much improved by the establishment of a co-operative silk union to finance societies whose members will rear cocoons and spin them into thread. It is expected that the silk union will start work soon. The industry at present therefore requires—

(*a*) Research.

(*b*) Continuation of the staff now doing propaganda in the villages.

(*c*) Increasing the outturn of selected rearers and elimination of the bad village seed.

(*d*) Improvement of the rearing houses and the introduction of the use of disinfectants and more hygienic methods. This is to be done by village propaganda and by the formation of co-operative societies.

(*e*) Disposal of the finished products through a co-operative union.

There are other ways in which the condition of these cultivators can be improved. At present the pierced cocoons are spun into thread called *matka* by the women of the household. By using a spinning wheel which costs 10 rupees the waste silk now sold at Rs. 1-8-0 per seer can be spun into thread for which there is a ready market at Calcutta at Rs. 8 to Rs. 10 per seer. Two seers can be spun in two days and the yield is about one seer of thread. What is rejected is probably still marketable as waste silk. The profit is obvious and this profit can be gained by the introduction of the spinning wheel. The Industries Department have three parties at work in Malda now demonstrating this method of the spinning which the cultivators do not know.

This state of sericulture is at present so bad that I do not recommend its extension as a subsidiary industry. The Agricultural Department will have quite enough work to do in the next few years trying to get it properly organised.

The industry can be made to yield a livelihood to the cultivator but the cultivation charges per seer must be reduced by teaching them how to fight disease and flies, where to get the best seed, and how to dispose of their produce to the best advantage. Introduction of tree mulberry also is desirable.

(ENCLOSURES TO NOTE A)

Statement showing the economic condition of the silk-worm rearers of village Serampur in the district of Malda

Serial No.	Name of rearers	Quantity of mulberry lands	Rearing accommodation	Annual Income		Annual Expenditure		Value of mulberry land	Debts	Remarks
				From sericulture	From other sources	For sericulture	Family expenses			
		Bighas	Ghoras	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	
1	Etwari Mondal	2	1	200	220	112	180	400	..	Other sources are mainly ordinary arable land, mango garden or day labour. Silk worm rearing is the main occupation of the family. Most of the work, however, is done by the women. The general conclusion I draw is that this industry is well worthy of attention and that there is no justification for the statement made on several sides that the silk industry in Bengal is doomed.
2	Faringi Barik ..	1½	1	140	100	82	240	250	40	
3	Sadhu Mondal ..	2½	2	280	120	164	180	500	15	
4	Dhananjoy ,, ..	1½	1	180	120	92	180	300	40	
5	Balaram ,, ..	2	3	360	550	256	540	400	..	
6	Ram Hari ,, ..	1½	2	240	225	164	420	300	500	
7	Amrit ,, ..	1½	1	140	128	82	144	250	150	
8	Fagu ,, ..	2	2	240	120	144	192	400	300	
9	Behari Saha ..	1½	1	160	230	92	240	300	50	
10	Naba Kumar Mondal.	¾	1	120	275	82	300	150	60	
11	Kachalu Mondal	1	3	360	250	296	240	200	..	
12	Aghnu Rajak ..	¾	1	120	135	82	144	150	120	
13	Bhadu Rajak ..	2	2	240	272	144	360	400	40	
14	Kashi Mondal ..	1	1	120	120	72	150	200	150	
15	Bihaspati ,,	1½	2	240	120	174	180	250	100	
16	Chabilal ,,	2½	1	240	120	132	140	500	150	
17	Gajaram ,,	1½	..	120	242	60	300	300	175	
18	Gopal ,,	1	1	120	120	72	180	200	125	
19	Ghaneshyam ,,	2	2	240	120	144	144	400	40	
20	Panchu ,,	¾	1	120	120	82	120	150	80	
21	Jagannath ,,	7	7	840	725	504	600	1,400	..	
22	Madhab ,,	¾	2	240	136	194	144	150	50	
23	Raghunath ,,	1½	2	240	200	164	480	300	250	
24	Panchu Barik ..	¾	2	240	125	194	180	150	25	
25	Parashu Mondal	2	2	240	125	144	144	400	600	
26	Mahesh ,,	1	3	360	225	296	240	200	700	
27	Madhu ,, ..	½	1	120	125	112	144	100	40	
28	Sukul ,, ..	2	3	360	255	256	300	400	200	
29	Krishna ,,	1½	2	240	200	164	240	300	150	
30	Ranajit ,, ..	¾	1	120	120	62	180	150	60	
31	Mahananda ,, ..	2	1	200	120	112	144	400	35	

Serial No.	Name of rearer	Quantity of mulberry lands	Rearing accommodation	Annual Income		Annual Expenditure		Value of mulberry land	Debts	Remarks
				From sericulture	From other sources	For sericulture	Family expenses			
		Bighas	Ghoras	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	
32	Janaki Mondal..	¾	1	120	120	82	120	150	..	
33	Bholanath Mondal.	2½	2	280	120	164	180	500	52	
34	Sarbeswar Mondal.	1¼	2	240	120	174	150	250	200	
35	Khantari Mondal	1¾	3	360	240	266	480	350	100	
36	Baroh Mondal	¾	1	120	150	82	180	150	100	
37	Amrit ,,	1¼	2	240	120	154	144	350	175	
38	Dinaram ,,	1	1	120	120	72	180	200	100	
39	Iswar ,,	¾	2	240	120	194	180	150	40	
40	Iswar ,,	1½	2	240	350	164	300	300	..	
41	Kanai ,,	2	2	240	250	144	540	400	400	
	Total ..	63¾	73	2,380	1,776	2,146	2,824	2,750	1,412	

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Statement showing the economic condition of silk-worm rearers of village Dhakunia or Kanchanpur in the Malda district

Serial No.	Name of rearers	Quantity of mulberry lands	Rearing accommodation	Annual Income		Annual Expenditure		Value of mulberry land	Debts
				From sericulture	From other sources	For sericulture	Family expenses		
		Bighas	Ghoras	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1	Sadhu Das ..	5	7	840	225	584	250	1,500	200
2	Rakhal ..	2	4	480	195	368	300	600	400
3	Nakul ..	4	3	440	140	256	150	1,200	1,000
4	Parameshwar ..	1	4	480	120	408	144	300	200
5	Jogeswar ..	2	3	360	100	256	250	600	500
6	Shrijutdhar ..	2	4	480	120	368	180	600	150
7	Sachinandan ..	2½	4	480	150	348	180	750	400
8	Kartik Das ..	3½	4	480	175	308	180	1,150	700
9	Bhabesh ..	2½	3	360	120	236	144	750	350
10	Biswamvar ..	2½	4	480	240	348	300	750	500
11	Kshetra ..	4	3	440	225	256	480	1,200	400
12	Adwaita ..	3½	4	480	200	308	300	1,150	600
13	Bhusan ..	8	4	800	300	448	192	2,400	1,200
14	Sripati ..	4½	4	520	300	408	300	1,350	350
15	Atal ..	½	1	120	600	92	240	150	115
16	Kalachand ..	1	2	240	200	104	180	300	..
	Total ..	48½	58	7,380	3,410	6,100	3,770	14,750	7,065
	Average per family	3·0	3·6	461·2	213·1	381·2	335·6	921·8	441·5

Mr. James Peddie.

Statement showing the economic condition of the silk-worm rearers of village Gorkhola in the district of Malda

Serial No.	Name of rearers	Quantity of mulberry lands	Rearing accommodation	Average Income		Average Expenditure		Value of mulberry land	Debts
				From sericulture	From other sources	For sericulture	Family expenses		
		Bighas	Ghoras	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1	Sabdar Hosen ..	10	7	1,080	4,000	728	1,200	2,500	4,000
2	Sadhu Sekh ..	10	4	1,080	2,000	728	750	2,500	800
3	Jamir Sekh ..	4	..	440	250	256	360	1,000	300
4	Akbar Sekh ..	5	2	520	400	296	500	1,250	150
5	Manib Sekh ..	5	4	520	500	296	500	1,250	400
6	Ramjan Sekh ..	3	..	320	350	184	250	750	..
7	Tinu Sekh ..	5	..	480	250	264	350	1,250	..
8	Isan Sekh ..	5	2	520	400	296	750	1,250	150
9	Chamaru Sekh ..	3	3	360	350	216	350	750	50
10	Mati Sekh ..	2½	1½	360	300	236	450	625	300
11	Aghanu Sekh ..	2	3	240	250	144	250	500	150
12	Suku Sekh ..	1	6	240	250	184	250	250	50
13	Nasru Sekh ..	3	3	360	300	216	250	750	100
14	Gondra Sekh ..	2	..	240	300	144	250	500	..
15	Sadhu Sekh ..	2	..	360	400	250	500	500	200
16	Chandra Sekh ..	2	4	240	250	144	250	500	100
17	Tenu Sekh ..	2½	2	360	400	236	300	625	200
18	Dula Sekh ..	4	..	440	250	256	250	1,000	100
19	Tifani Sekh ..	2	..	240	300	144	300	500	50
20	Sialu Sekh ..	5	1	520	350	296	400	1,250	500
21	Shahebjan Sekh ..	3	2	260	700	216	800	750	300
22	Agajan Sekh ..	4	4	440	300	256	300	1,000	150
23	Saburjan Sekh ..	2½	..	360	250	236	250	625	200
24	Amir Mahalat ..	6	5	840	1,500	512	800	1,500	900
25	Manir Munshi ..	6	2	680	600	400	800	1,500	800
26	Sanif Pandit ..	5	6	560	2,000	328	800	1,250	800
27	Kutubuddin ..	4	3	440	500	256	500	1,000	300
28	Khosail Sheikh ..	8	4	800	600	448	500	2,000	500
29	Atabuddin ..	2	2	240	250	144	250	500	100
30	Pusha Sheikh ..	6	..	600	350	336	350	1,500	100
31	Asharoo Sheikh ..	5	..	520	250	296	250	1,250	100
32	Oaresh Ali ..	4	..	440	250	256	300	1,000	300
	Total ..	133½	70½	15,200	20,300	9,196	14,360	32,375	12,150
	Average per family	4·1	2·2	475·0	634·3	287·3	448·7	1,011·7	379·6

Mr. James Peddie.

Abstract of census of mulberry lands in the district of Malda

Name of thana	Number of families of rearers	Rearing accommodation	Quantity of mulberry lands	Increase	Decrease
		Ghoras	Bighas	Bighas	Bighas
English Bazar	2,581	5,739	5,799	1,402	1,313
Gomastapur	219	165	175	11	31
Old Malda	234	553	463	1	39
Ratua	312	463	665	2	222
Shibganj	93	108	209	2	11
Nawabganj	270	370	399	7	65
Bholanat	895	2,835	2,073	277	30
Manikchak	241	284	512	5	99
Kaliachak	2,698	7,067	6,795	831½	726
	7,543	17,586	17,090	2,537	2,536

The above figures represent about one-third of the total area.

Abstract of census of mulberry lands in the district of Malda

Name of thana	Quantity of mulberry lands	Probable outturn of mulberry leaves	Probable outturn of cocoons	Quantity of seed required
	Bighas	Maunds	Seers	Seers
Old Malda	463	34,725	52,087	744
Ratua	665	49,875	74,812	1,069
Bholanat	2,073	155,475	233,212	3,331
Shibganj	209	15,675	23,512	336
Manikchak	512	38,400	57,600	823
Nawabganj	399	29,925	44,887	641
Gomastapur	175	13,125	19,687	281
English Bazar	5,799	434,925	652,387	9,319
Kaliachak	6,795	509,625	764,437	10,921
	17,090	1,281,750	1,952,621	27,465

The above figures represent about one-third of the total area.

Note B

Lac.—Lac is an important subsidiary industry to agriculture and in Malda district there are some of the best lac jungles in India. After the War, prices of crude lac fell so much that many persons gave up cultivating it. This year the refiners in Murshidabad and the neighbouring Bihar districts are closing down their factories because there is no supply of crude lac and the crude lac producer is not growing the lac because he says the price of crude lac is too low. If however the cultivator takes up refining of lac—a very simple process—he makes a profit at once. It will necessitate the bringing of experts here and the training of the local cultivators but it can undoubtedly be done. Six men working in two shifts can refine one maund of crude lac a day. The cost of crude lac last week was Rs. 20 a maund, of superfine refined lac Rs. 90 and ordinary refined lac Rs. 75. From two maunds of crude lac one maund and ten seers at least can be obtained of which one maund will be superfine lac. The remainder usually thrown away can be made into toys and other things. This needs propaganda and co-operation. The cultivators are conservative and do not like new things. Meanwhile the trees have no lac on them and all the money which used to come to this district from the sale of lac is now going elsewhere.

Lac cultivation is well known here as a subsidiary occupation. What is required is the teaching of the process of refining lac and arranging for the disposal of the finished products.

Note C

OTHER INDUSTRIES

Basket making.—This is confined almost entirely to *Doms*. Other castes object to the work.

Poultry keeping.—This would be developed among Mahommedans and aboriginals. Hindus object to it for caste reasons. People keep hens mainly for their own use. There is nothing resembling poultry farming though in certain tracts Mahommedan cultivators keep poultry for sale in the markets. In most rural markets poultry can be bought on the market day.

Bee-keeping.—No one has any idea of how it should be done. I do not think it is very suitable as an industry subsidiary to agriculture in India.

Rope-making.—This is done mainly by widows. The ordinary cultivator makes ropes only for his own use. This might be encouraged. The main difficulty is the laziness of the cultivator who prefers to sit and do nothing when he has some spare time.

Oral Evidence

23279. *The Chairman* : Mr. Peddie, you have put in a very valuable note for which the Commission is greatly obliged to you. Do you want to say anything in general at this stage?—No.

23280. May I ask you to turn to the printed note of your evidence? You have attached to it a very remarkable body of statistical information?—I should like to say that those figures were sent off unchecked; there are probably some inaccuracies, but the general conclusions which are to be drawn from those figures are probably the same as they would be after correction.

23281. When were they collected?—They have only just been collected.

23282. They were collected fresh for this Commission?—Yes.

23283. In your own Collectorate?—Yes.

23284. Had you made surveys of this nature before you collected these statistics? —In collaboration with the Sericultural Department we had begun a survey of the sericulture area on the same lines. Part of the results of that survey is embodied in this.

23285. Will you turn to page 423? You are talking about agricultural education, and you say, " school farms if they can be developed would be a much more practical way of securing the general spread of improved methods of agriculture." Do you see any difficulties in connection with the management of those farms?—There will be considerable difficulty unless we get in people who have been properly trained.

23286. Is it not much easier to train people to handle a small garden intelligently and to teach what can be seen in the garden than to train the same people to manage a farm on a commercial basis?—I agree.

23287. And, of course, any failure on the commercial side of a farm of that sort would make it the laughing stock of the district, would it not?—It would.

23288. With regard to your remarks on the same page on adult education, have you any indication of what a campaign in adult education might achieve? Can you cite any experiments which have been made?—I have no experience of it at all; I have heard that in Madras a certain amount has been done, but I do not know enough about it to say.

23289. On the same page again on the question of demonstration, would you agree that demonstration on the cultivator's own holding is probably the most efficacious method?—The question is how it is to be done, how you are to get the cultivator to allow you to do it.

23290. You do not think it is possible to persuade him to make an experiment?—I think, in the case of jute, it is possible with the larger cultivator; I think that is the only possible way in which it can be done.

23291. A demonstration farm under the control of Government is always suspected to some extent by the cultivator?—I think it would be very much better to have it under unofficial control with Government supervision.

23292. You point to the insufficiency of the staff of the Agricultural Department for dealing with the task in the way in which you would like to see it dealt with; is not that shortage due to financial difficulty to some extent?—It is entirely due to that.

23293. You are talking about developing the Unions as Agricultural Associations, and a little later on in your note you affirm your faith in the co-operative movement. Do you think that encouraging the Unions to take on these functions would to some extent limit the future of co-operative organisation?—I do not think that we ought to let the Union Boards determine for themselves what is to be done. I think these Unions should have Agricultural Associations within them and the object ought to be for the executive of the Union Agricultural Association to keep in touch with the District Agricultural Officer.

23294. You mean to have the Union as the territorial unit and within that to have, an Agricultural Association?—Yes; if the people will not accept any close association at all, to begin with we might have a very loose association with an executive.

23295. You assume that they will ultimately develop into a co-operative organisation?—The main thing about that which I would like to say is that I do not think anything will be done unless Government lead the way.

23296. You seem to be quite clear on the point and also that the organisation should begin from the bottom?—Yes.

23297. Through organising village communities?—Yes; I have tried District Agricultural Associations, but the District Agricultural Association is of very little use unless it has got something with which you can keep in touch at the bottom.

23298. On page 425, talking about roads, you say that the District Boards have no money. Do you think they have the will?—They have got the will, and there is a growing demand for improved roads. I am speaking mainly about my own district, which is a very poor one comparatively with some of the others. There is now a growing demand for motorable roads, which will inevitably force them to do it. I am told unofficially that Government have turned down the proposal for a cart tax, on the ground of the difficulty of collection.

23299. You say there is a growing public demand, and you discuss the possibilities of improving the roads, and you come to the conclusion that a tax on carts is the best way. Would not a tax on motors meet the point?—Where you have got only about ten motors it would be of little use, but you have got a lakh of carts.

23300. I think that is a good answer. Would you like to see the motors pay their share?—I would most certainly like to see them pay their share.

23301. On page 426, you are talking about the tendency of the land to pass from the hands of the cultivating tribes into the hands of the non-cultivating classes; that is what it comes to, is it not?—Yes.

23302. Can you observe any deterioration in the quality of cultivation, as a result of this movement?—No.

23303. You think the fields have been just as well cultivated?—Only a few days ago, I suggested to some cultivators that they should put a *bund* over a valley in order to store the water, and they said " Why should we put a *bund* over it "? I said " You are going to get more crops.". They replied " We are only the *adhidars;* why should we do it? The *mahajans* should do it."

23304. Are most of the people who own land cultivating it as labourers or as sub-tenants?—A very large number of them cultivate on the *adhi* system and get half of the crop; the *mahajan* allows the man to live on the holding and takes half of the crop.

23305. Has he any rights at all?—No rights whatever.

23306. Liable to be ejected at any moment?—Within a year.

23307. On page 427, you deplore the fact that the Usurious Loans Act is not more frequently made use of. Do you think the Act itself is satisfactory?—Except for the fact that it is a little vague, I think it is. Munsiffs have complained to me, when I have been talking to them about it, that they do not know quite what to do; it is too vague.

23308. And then there is the other trouble to which you have referred, namely, the extreme poverty of most of the injured parties?—Yes.

23309. Have you noticed any tendency on the part of credit societies to which you have referred on page 426 to reduce the rate of interest extorted by *sowcars* in the district?—Co-operative credit societies?

23310. Yes; do you think they are having the effect of reducing the general level of the rate of interest?—That is the case, when you can get a sufficient number of them together in a block.

23311. The general impression I got from the reading of your note and of the statistics that you have provided is that the situation is, in your view, deteriorating progressively in these rural areas?—That is so.

23312. How do you account for this progressive deterioration?—As far as Malda district is concerned, ten years ago it was nearly all jungle land; it is now all under cultivation and there is no more ground to break, and naturally that is the result. Formerly when a man lost land he could go into the jungle and cultivate another bit; he can no longer do that now, and the result is that those who stay are becoming more and more impoverished, whereas the wandering tribes like the Santals are very largely clearing to the hills.

23313. Are they going to Assam?—Yes.

23314. To the tea plantations?—They go to the tea plantations from Midnapore, but there is no recruitment of Santals from Malda. Many of these people go off

on their own and take up cultivation in the jungles in the Terai, both in Bengal and in Assam.

23315. What is the density of the population for this district that you are talking about?—There is a population of 10 lakhs in an area of 1,800 square miles; it varies very much; in the *diara*, on the river side, it is high, but in the high land which is a one-crop area, it is very very thin.

23316. Do you see any change in the standard and quality of cultivation, as a result of this deposition of the owners?—No, I have not seen any difference in the standard of cultivation.

23317. With reference to husbandry, what type of farming in the district do you know best?—I do not know any of them very well, because I am not an expert.

23318. Is your present Collectorate, broadly speaking, a low lying area?—It is high land on one side, *tal* land in the middle and *diara* land on the other side.

23319. It is the high land here where you suggest the cultivation might well be remedied?—There are two kinds of lands which require attention. One is the tract of black soil; it is an old river formation on the top left-hand corner of the map; that is the wheat growing area. At present they grow jute; they tried to grow *aman* paddy, but there is such an extensive amount of water when the area is flooded that jute and paddy are drowned out. Whereas, if they could get water in the cold weather they would be able to get *rabi* crops of wheat and oil seeds.

23320. Do you mean that is *tal* land?—Yes.

23321. Is that the rib running through the country?—Yes, that goes through Dinajpur into Bogra and down into Rajshahi.

23322. What approximately is the scale of this map?—Five miles to the inch.

23323. You suggest that the higher ridge might be irrigated and produce wheat amongst other things?—It is partly paddy growing, but if you can supply the water they can take a second crop off the land.

23324. You suggest that this might be irrigated by gravity?—If they can harness a sufficient number of these hill rivers, then it may be possible to bring it down by canals along the tops of ridges; whether that is possible will depend entirely on an enquiry extending over all these districts.

23325. No practical survey has been carried out?—No; they have put in one or two gauges in these rivers to see how much water they carry.

23326. Are there any wells in this district?—Not many; I think there are three wells in one of the *barind thanas*.

23327. At what depth below the surface is the water?—The wells are sixty feet deep; I do not think that you would get a sufficient supply of water for well irrigation in that area.

23328. When did you put up these schemes?—About a year ago.

23329. You had no answer?—The Irrigation Department have been working in the district ever since that time; they have put in a certain number of gauges, and they are collecting the statistics with as many people as they can spare for the work. I think that, if finances permit, there is large scope for work in irrigation, and there is also a growing demand for it. One talks to the zamindars and other people, and they are now beginning to ask that something should be done.

23330. Do you find the zamindars take an interest in these improvements?—Not generally, but there are one or two who are keen. One of these schemes was put up by a big zamindar; he takes a keen interest in it, and that scheme will probably be put through, as he is the owner of the *tal* land.

23331. Do you connect the irrigation of these areas with the problem of providing fodder crops?—It would have a very marked bearing on the question of the supply of fodder crops. You cannot grow fodder crops at present, simply because you have no water; in the *diara*, there is a possibility of growing fodder crops.

23332. Is it a malarious area?—It is.

23333. About how many days in the year does the average healthy male, during the working years of his life, spend on his back?—In the one crop area, about two months.

23334. On his back?—On his land.

23335. How much time does he spend on his back as a result of malaria?—I am afraid I cannot give you the figures.

23336. We have heard some remarkable figures suggested, I think from 60 to 90 days in the year?—In a village which is badly affected, the whole village will be laid up for probably three months, and practically no work will be done. In one village last year, out of 300 people there were 100 deaths, and all the rest of the people were absolutely incapable of doing any work whatever owing to malaria; but it varies from year to year and from locality to locality within the district.

23337. Have you any indication as to whether malaria is growing in intensity or declining?—The local people say that it is growing in intensity, but I am not so sure that that is the case.

23338. Have you any natural leaders amongst the people, any better-to-do people who concern themselves with trying to improve conditions or trying to lead the people?—That is one of my great difficulties, to get honorary workers who would really put their backs into it and do a bit of spade work. There are one or two, but most of them have got other business to attend to, and cannot put in a sufficient amount of work in this direction.

23339. We have had some interesting evidence about sericulture from other witnesses. Would you agree that, broadly speaking, the average income from land under mulberry would be about Rs. 200 an acre?—I do not know enough about it to speak to figures.

23340. You have given us some figures here; you have been quoting figures?—Most of these I have got through officers of the Sericulture Department.

23341. Have you studied them yourself?—I have not studied them myself at all; I cannot say how much they get from mulberry.

23342. Are the people in your own Collectorate engaged in sericulture?—A very large number of them are.

23343. Whole-time or part-time?—Both.

23344. Would you wish to see sericulture extended as a whole-time occupation, or would you rather see it extended as a part-time occupation?—Our main object should be to try and make it a better whole-time occupation for those people who are whole-time sericulturists and stick to that at present. I think we will have quite enough to do if we try to accomplish that just now, but its extension as a subsidiary occupation is a question which I think is of doubtful value, on account of artificial silk.

23345. I should have thought that the case against extending it as a whole-time occupation on account of artificial silk was stronger than the case against extending it as a part-time occupation?—I do not mean to extend it to a larger number of people; I mean to improve it as far as the people who are at present occupied are concerned. I do not know how far artificial silk will affect sericulture, but I am told that a large number of centres up-country are now using artificial yarns instead of Malda yarns.

23346. Have these facts and data about marketing that you have provided us with been collected by yourself?—They were collected from zamindars and from various officers in various departments in the district.

23347. Have you ever gone into cases where money has been lent on the security of the crop to see whether the moneylender writes off a fair proportion of the debt on account of the crop when he takes it?—I have not gone into it.

23348. Would you agree that that is a sort of occasion upon which unfair dealing might take place?—I think that it very often does, from what I have heard.

23349. I think in your note you say something about the possibility of registering moneylenders?—Yes.

23350. Do you think that public opinion in that respect has reached a point where that would be expedient?—I do not mean by moneylenders the more or less respectable banks in the big towns; I mean village moneylenders; the small man in the village is at present, I consider, a danger.

23351. But in the definition of moneylender there would be difficulty?—Yes.

23352. Do not most cultivators lend money, if they have it, at some time or another in their life?—The cultivator, when he does get money, becomes a moneylender; that is perfectly true; he will then fall within the definition and ought to be registered.

23353. Have you attempted to measure at all the staff that would be required to administer a system of that sort?—No. But even if there was not very much inspection, the very fact that the man had to take out a license and had to keep accounts which were available for inspection might be of some use.

23354. You have pondered over the matter, and it is your view that the experiment might be made?—I think something should be done, and I cannot think of anything else.

23355. What is the extent of the average holding in your Collectorate?—It is very small. In some villages, I think it is as low as 2 *bighas*, that is, less than an acre.

23356. Is fragmentation a burning problem?—There is a great deal of fragmentation, but I think it is very difficult to do anything with that in Bengal.

23357. Do you think there is any real appreciation on the part of the cultivators themselves of what a burden fragmentation is upon them?—I do not think they realise it at all, but when it is explained to them they understand it. When you ask them, they say " Yes ", but not until it is explained to them.

23358. That sort of thing does not occur to them unless you are there to tell them?—That is so.

23359. Have you ever known cases where two or three persons have come together to attempt some measure of consolidation of their holdings?—I have never come across such a case.

23360. Take appendix G* for instance, " Statistics of economic condition in rural areas collected in typical areas ". Are these the facts that you have been good enough to have collected for us within the last few weeks?—Yes.

23361. Have you had any time to examine them in detail?—No.

23362. You agree with the figures giving the family budget?—I think those are rather ideal, but I did look at them before they were sent off and made some enquiries, and as far as I can find out they are reasonable.

23363. You have given figures for a family with no crops of its own and purchasing articles in cash; is that just an ideal?—It is bound to be an ideal budget.

23364. Is it assumed that wages are being earned?—Yes. That man may be labouring for another man, or he may be cultivating a certain amount in *adhi*, that is, cultivating and getting half of the crop.

23365. *Sir Henry Lawrence*: Is any part of the district permanently settled?—It is all permanently settled.

23366. How long have you been there?—Two years.

23367. Is the Usurious Loans Act ever used?—Yes; it is used by the Munsiffs occasionally on their own initiative.

23368. Is it used in a large percentage of cases?—A very large percentage of cases are *ex-parte*, and in practically no *ex-parte* suits do they use the Usurious Loans Act.

23369. It is used only in a very small percentage of cases?—Yes.

23370. Do the debtors know enough about it to claim its application?—No. The ignorance of the debtors is one of the reasons why there are so many *ex-parte* suits; they have not got the money even to pay for a pleader to support their cause.

23371. If a man employs a pleader, does he not ordinarily ask for the application of the Usurious Loans Act?—I do not know.

23372. Your opinion is that it is generally a dead letter?—That is my opinion.

23373. Is there any means of stimulating the Munsiffs to make use of it more frequently?—I think it should be possible to get the Act so altered that the Munsiff will have some guide as to what should be considered reasonable.

23374. He cannot do anything in the absence of a guide?—That is so.

23375. Is not that a weak point—the absence of a stimulus to the Munsiff to take the trouble?—There again the difficulty is the fact that the Munsiff is overworked, and when he comes to *ex-parte* suits he has hardly the time to look at them. " If I look at every one of those cases, my file will become still more in arrears than it is at present." That is the answer which I have got when I have put that question to Munsiffs.

*Not printed.

23376. Then, is it any part of any other portion of the judicial machinery to see that the Munsiffs employ this Act?—They are under the District Judge.

23377. It is partly his duty to see that the Usurious Loans Act is utilised?—As far as I know, when he inspects the Munsiffs he will probably see whether they were using it properly or not.

23378. Did you ever see any comments or notes made by a Judge on Munsiffs' work?—I do not know.

23379. You do not know how far the District and Sessions Judges have taken cognisance of the Act?—No.

23380. Is that Act brought in review by the High Court?—I think so.

23381. Have you ever seen any comments by a Judge of the High Court on the subject?—No.

23382. Is it brought under review by the Government of Bengal?—I do not know whether it has been or not.

23383. There are various points at which some stimulus might be applied; you do not know whether they have been?—No.

23384. You say there are only three wells in the *thana* of Habipur. Where do the people get water from?—Some of them go 2½ miles, mainly to tanks and some non-perennial streams which they dam up to keep a little water until April; in certain places they dig holes in the ground where a little water remains until March. The only wells I know of are three big wells dug by the District Board.

23385. How is the water in these tanks?—It is very bad indeed.

23386. Is the population increasing very rapidly?—The population in the *diara* has increased but not very much. As a whole the population is increasing.

23387. Is it due to immigration or natural increase?—Mainly natural increase. Now, the immigration has practically ceased. There was a very large amount of immigration from Bihar when the jungles began to be cleared up.

23388. As a whole the people are in a poor condition, and the condition is deteriorating?—I think so.

23389. Is emigration open to them?—Yes; large numbers of them go to the hills. They are more or less wandering tribes like the Santals.

23390. Is it seasonal emigration?—Some of them go away and never come back.

23391. Is the population Santal?—The population in the high land is Santal. The emigration is from that class.

23392. The rest of the people?—Mainly Mahommedans and a certain number low caste Hindus.

23393. Do they emigrate?—No.

23394. Do they go to the tea gardens of Assam and Ceylon?—No.

23395. There are no restrictions to their movement?—No.

23396. How far is your district from Pusa?—I do not know how far.

23397. There are schemes under consideration for irrigation. Do these schemes require co-operation with the adjoining Province of Bihar and Orissa?—The *tal* scheme is the only scheme where we require co-operation with Bihar and Orissa That has evidently been done, because I know the Irrigation Officer of Bengal has been working in the district of Purnea.

23398. Is the Irrigation of the *tal* to be by means of a reservoir tank or a canal?—Probably from a river by means of sluices and canals.

23399. There has been joint action between the two Governments. Has your district been contour surveyed?—No.

23400. Has there been any difficulty with measurements?—I do not think there has been. All that they have done is to measure the depth of the rivers at selected points and the flow in the rivers.

23401. What evidence do you see of the deterioration in the condition of the people?—The deterioration in the condition of the people I infer from the fact that they are losing the land and becoming landless labourers.

23402. It is not the physical condition?—I do not mean their physical condition.

23403. They are not starved?—I have seen no signs of starving. But last July when I went out on tour in the one-crop area, I made enquiries and I was told

that the people had eaten all the paddy from the last crop and that the majority of them were living on one meal a day.

23404. If you got irrigation, would it convert a *kharif* crop area into a *rabi* crop area?—In the *tal*, it will be the case. If you give water in the high land, it will mean five full crops and five catch crops, instead of two full crops and two catch crops.

23405. No water is required in the *kharif* season?—In the high land, water will be required at the time of planting paddy in July and before reaping in October and November, and water will be required throughout the cold weather and the hot weather for the second crop. It also grows good vegetables. If you give them water they can grow very good vegetables.

23406. In permanently-settled areas is there any difficulty about charging water rates?—I do not see why there should be.

23407. That must have been considered?—Under the Irrigation Act it can be done.

23408. In another Province, we were told that irrigation could not proceed unless legislation was carried, because of the rights of zamindars in permanently-settled areas. That does not apply here?—I do not think so; it has never struck me before. I discussed it with the Chief Engineer, Irrigation Department last year, and he intended to put this through under the Irrigation Act.

23409. *The Chairman* : Is the water rate charged on the land or is it charged for water supplied?—There are two ways. The charge is for water supplied where you benefit a particular land by giving it water. Where you are benefiting the land by holding up the water and then allowing the water to come down gradually so as to benefit the whole of an area, the charge is attached to the land.

23410. *Mr. Gupta* : What are the Acts governing the charge?—The Irrigation Act and the Agricultural and Sanitary Improvements Act.

23411. Are you thinking of canals or other irrigation schemes?—Irrigation schemes.

23412. They would not be under Act VI (Agricultural and Sanitary Improvements Act)?—There is an Irrigation Act.

23413. That is only for canals?—Under the Irrigation Act, you can have canal irrigation. Other types will be done under Act VI of 1920.

23414. That Act does not provide for charge for water?—That will be for the land where the water is used.

23415. *Sir Thomas Middleton* : How many Circle Officers are employed in each Collector's district?—It depends upon the area which has not already been formed into Union Boards. The Circle Officers often go according to the number of circles. In Malda they have five circles. I have got three Circle Officers. The people are so ignorant in the other two circles that it is impossible to start Union Boards.

23416. What is the pay of these Circle Officers?—I do not remember the actual figures. They are sub-deputy magistrates.

Mr. Gupta : It is Rs. 150—400. They are sub-collectors.

23417. *Sir Thomas Middleton* : You suggest that they should be used for improving agricultural conditions?—The Circle Officer has got to go to the Union every quarter to inspect the accounts and talk to the President. If he has got to go there I do not see why he should not talk to the cultivators and why he should not get some training in order to be able to talk to the cultivators.

23418. If he gets so much salary, I do not see why he should not?—I do not see why one or two months' training in the Dacca farm should not materially assist him in carrying on propaganda. It would involve the creation of a few more Circle Officers, because you will have a certain number more under training. But that is all it would mean.

23419. Then, you suggest that part of the money provided under the Agricultural Loans Act should be at the disposal of the Director of Agriculture?—Yes.

23420. At present at whose disposal is it in a district?—The Commissioner is in charge of the grant for the Division, and he allots a certain amount to the Collectors according to their requirements.

23421. At present if the Director of Agriculture wants a certain amount, does he ask the Collector?—He never does.

23422. The money is there, and he never applies for it?—I have never known of a case where the Director of Agriculture has gone to the Collector. I have used the agricultural loans for purposes of propaganda in the Sericultural Department, but I did that in consultation with the office of the Director of Agriculture and the Sericultural Department, so that it is not really correct to say that the Director of Agriculture has never gone to the Collector. The sericultural officers get money through me.

23423. Your suggestion is that when the Director of Agriculture wants to give money for seed, he might apply to the Collector and money would be there for the purpose?—Yes. I think that if this is done probably more would be required because the estimates at present are based on the demand from the ryots, and there is practically no demand for it.

23424. *Mr. Gupta*: Will you kindly refer to page 424 of your note where you make some remarks about the way in which the District Officer and the Circle Officer could help in the improvement of the agricultural conditions of the district? You say, " If this is to be done, it must be made part of the Collector's duty to foster these associations and it must be made part of the Circle Officer's duty. One finds everywhere that, when the District Officer takes an interest in the work of one of the ' nation building ' departments, the officers of that department are able to accomplish more than in other places. District Officers have had District Boards taken away from them. The routine work left is often dull. I am strongly of opinion that the District Officer should be in charge of the agricultural propaganda as well as the propaganda of the Co-operative and Industries Departments." I entirely agree with those views. Do you not think that a comprehensive resolution by Government drawing the attention of Collectors and the departments concerned, might be useful? A resolution on the report of the Agricultural Department probably might escape attention. Are you aware, for instance, that in the last resolution Government said that Collectors should co-operate as far as possible?—I know Government had done that. My point is that District Officers should be impressed with the importance of this work.

23425. I quite agree. Could not that be done by a resolution drawing the attention of Collectors to the changed conditions of the country and the need for Collectors to give more time to what are called nation-building departments?—It might be.

23426. You have quoted some figures and made some observations regarding the deterioration of the condition of the people in your district. I have not had time to study them, but I presume they do not apply to the whole of your district for instance, the *diara* areas of Manikchak and Kaliachak?—Many of these *thanas* are in the *diara*.

23427. Is it your opinion that the condition of the people in the Kaliachak is deteriorating?—I do not think they are deteriorating.

23428. It is more in the *barind* and jungle tracts?—Yes.

23429. When you put in a plea for the improvement of the district roads, will you justify the need for the improvement of roads without referring to the necessity of providing good roads for motor cars?—Yes. Besides the improvement of roads, people want motorable roads.

23430. When there are only eight or ten motor cars, a general tax on motor cars would not be justified?—Undoubtedly.

23431. *Mr. Calvert*: You suggest that part of the allotment under the Agricultural Loans Act might be placed at the disposal of the Director of Agriculture for certain purposes. But does any obstacle at present come in the way of your doing that?—There is not enough money in the allotment.

23432. You can lend money to the people for those purposes?—I do.

23433. There is no objection at all to carrying out the policy?—None at all.

23434. Would you be prepared to say whether the number of moneylenders in your district is increasing or not?—I think it has increased considerably in the last ten or twenty years.

23435. Do you think the amount of capital involved in moneylending is also increasing?—I think that is undoubtedly so.

23436. Have you had complaints in your district about dishonest account-keeping?—I have heard many complaints. The receipt is written on the back of the document, and in many cases no receipt is made out at all.

23437. Have you heard of the Moneylenders' Bill in the Punjab designed to make moneylenders keep accounts in a prescribed form?—I have not heard of it.

23438. Do you think it would be feasible?—I do not see why it should not be. It is all a question of supervision. The provision of supervision will act as a deterrent even if the supervision is going to be only after ten years.

23439. It will be inspected in civil courts?—Yes.

23440. *Sir Henry Lawrence* : Was that Bill passed?

Mr. Calvert : It did not receive the sanction of the Governor; Government propose to bring in a Bill along the same lines.

23441. Your proposal to register moneylenders would have been acted upon in the Punjab but for the fact that the members of the Council thought that some of them would come under the description of " moneylender " and the Bill had to be dropped. Would that apply to this Province also?—I spoke about this to one or two people, and they have raised that point. The whole thing is the Legislative Department has never been able to provide a definition which will be acceptable.

23442. In your district, beyond the professional moneylenders and moneylenders by caste, are there amateur moneylenders?—There is a very large number of them. There are agriculturists who carry on moneylending at times.

(The witness withdrew.)

The Commission then adjourned till Monday, the 13th December, 1926, at Shillong (Assam). For Assam Evidence see Volume V. The Commission dispersed for the Christmas holidays after taking evidence in Assam and resumed its sittings at Dacca on the 5th January, 1927.

Wednesday, January 5th, 1927

DACCA

PRESENT :

The MARQUESS OF LINLITHGOW, D.L. (*Chairman*).

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S.
Sir THOMAS MIDDLETON, K.B.E., C.B.
Sir JAMES MACKENNA, Kt., C.I.E., I.C.S.
Mr. H. CALVERT, C.I.E., I.C.S.
Professor N. GANGULEE.
Dr. L. K. HYDER.

Mr. J. N. GUPTA, I.C.S.
Rai A. C. BANNERJI Bahadur } (*Co-opted Members*).

Mr. J. A. MADAN, I.C.S.
Mr. F. W. H. SMITH } (*Joint Secretaries*).

Mr. E. F. OATEN, M.A., I.E.S., M.L.C., Director of Public Instruction, Bengal

Replies to the Questionnaire

QUESTION 23. (*a*) As regards elementary education, it is not so much the system of education that is in question as the lack of system. It is not a matter of curriculum. In Bengal we have in the Revised Curriculum for Primary Schools, 1920, adhered to the policy laid down in the Government of India Resolution of 11th March 1904 that "the aim of rural schools should be not to impart definite agricultural teaching but to give the children a preliminary training which would make them intelligent as cultivators, would train them to be observers, thinking and experimenting in however humble a manner, and would protect them in their business transactions with the landlords to whom they pay rent and the grain dealer to whom they dispose of their crops." But as things are to-day, it is not possible to do much by mere manipulation of curriculum, though if and when a real step forward can be made in rural primary education the question of the curricula will be of first rate importance. But to-day a preliminary requisite of any improvement in rural education is adequate finance, on the basis of which a reasonable system of rural primary education, both on the administrative and pedagogic side, might be built up. The existing voluntary one-teacher village school of thirty to forty children, with classes dwindling as each higher class is reached, can have no future. Neither school gardening nor reading nor anything else can be adequately taught in present conditions. "A very careful examination of a very large number of primary schools has led me to the deliberate opinion that we cannot hope to improve these schools very much in present circumstances." So wrote Mr. Biss in his first report. My answer to the question so far as primary education is concerned is therefore that the inadequacy of the rural primary education system—or rather lack of system—has been detrimental to agriculture as it has been detrimental to every other rural activity—no more and no less—simply because it is inadequate, and that it is not so much a change in the system as the creation of a system which is needed. If Bengal cannot economically afford the taxation necessary for the creation of a system there is no hope for anything except inadequate palliatives; if it can and will, it will be repaid a hundredfold, through the revivifying of rural life which will follow, and the consequential increase in the efficiency of the main source of its economic life—agriculture. The Government of Bengal Resolution* on Primary Education, dated September 25, 1926, is in accordance with the views expressed in this note, and aims at a comprehensive tackling of the problem of rural education.

Next comes secondary education. The secondary school system of Bengal came into existence largely in response to a demand for what was really vocational education for those vocations which obviously existed mainly in towns—Government service, the law, clerkships, medical, journalistic. Within the limits of its aim it did its work well—its products obtained posts or work of some sort. Now that the products of the system

* No. 3222-Edn.—Not printed.

exceed the number of posts open to them owing to the increase in the number of schools and colleges, and the fact that the cultivator's son is taking advantage of the system of higher education, the system no longer satisfies, and its defects which really existed before are realised in some degree. There comes a demand for "vocational" training, often for vocations which scarcely exist, and the demand so far as rural areas are concerned naturally translates itself into a demand for vocational training in agriculture, the main occupation of the country side, a demand which is really a belated recognition of the fact that all men cannot escape through education from the course of Adam.

The secondary educational system, as it has extended itself to the rural areas, certainly needs modification to bring it into some relationship with the life of the country. If in its present form it has done little harm to agriculture, it has certainly done little good to it, since it has little relationship with it. It tends to draw the pick of the rural areas away from the country instead of equipping them for life in it. This is doubtless largely the result of economic conditions—openings are few in the country—but a secondary education which cannot influence the main activity of Bengal certainly needs overhauling. It has however grown up in response to a need, to a large degree unaided by Government, and it obviously meets a demand. As to possible changes, I see every advantage in experiments on the lines of the vocational agricultural middle school recommended by the Missionary Commission on Village Education, 1920, where adequate funds, competent guidance, and suitable conditions exist. But any general vocationalising of the rural school system is a dream. For the generality of the schools I think the main change that can be attempted is to introduce some form of "practical training" into as many middle and high schools as possible. In rural districts, the practical training would often naturally be one or more of the agricultural or allied processes suitable to the locality whereby the divorce of school education from all relationship with the life of the boy might be modified. But any general vocationalising of the rural schools in the near future seems to me so impracticable that it is hardly worth while discussing whether it would be educationally justifiable or economically profitable. We have to deal with things as they are. Finance, the educational demand and social facts combine to forbid any general change, even if we considered it right. On the second point—the demand—Mayhew: "Education of India" is worth quoting:—

"Distinction of courses, if it is to be real, must involve the exclusion from Universities of those who have taken the non-academic course. No Indian parent will take the risk of such exclusion."

Even to introduce one practical subject, whether industrial or agricultural, even simple manual training, in all the middle and high schools of Bengal will be beyond our resources for some years. We are in Bengal trying to make a real beginning of linking the middle school system with rural realities by starting in a small number of schools a scheme for agricultural work in middle schools borrowed from the Punjab. It is hoped that funds will be allotted for the purpose early. The object is to give to the boys such an outlook on rural life that they will return to the land with minds better prepared to receive agricultural training, and with interest aroused in agriculture and its possibilities. Further than this except experimentally, I would not go, as far as general schools are concerned, though I would watch and develop to their utmost any successful experiments.

In general, I feel that the first need in secondary education which must be met is that of ensuring the existing teacher a living wage with a view to making the teaching of the rudiments of knowledge efficient, and any diversion of the available funds from this object except to a limited extent would be a disaster. For the raising of the economic efficiency of the country side, so far as general education can affect the problem, I would concentrate on a really efficient primary educational system. The other desiderata will follow or will become easily attainable. Any revised secondary school curriculum based on an inadequate primary school system can accomplish little or nothing. If combined with the introduction of an efficient primary education system in rural schools, we could (*a*) raise examination standards in secondary schools, (*b*) pay middle and high school teachers better, (*c*) create an adequate secondary education authority in which rural interests are represented, and (*d*) give a practical bias to the work of the middle and high school of a kind suited to rural conditions, we should accomplish much. The curriculum can doubtless be improved; but our main task in secondary education is to do more efficiently the work we are already attempting.

Collegiate education like secondary education has little relation to the rural economy. The higher educational system came into existence to prepare students for professions followed in towns, and it has received no essential modifications in this respect. The Calcutta University Commission advocated a Faculty of Agriculture and a University course in Calcutta as a beginning, and added emphatically "We are bound to regard it as an experiment." I am doubtful of the capacity of the rural economy to absorb many

highly trained agricultural experts. The Commission also advocated the inauguration of agricultural courses in the proposed intermediate colleges, and an improvement in the facilities for the study of the sciences which underlie agriculture.

These proposals have not yet been carried out though the University has not dropped the question of agricultural training under its auspices. The higher educational system of Bengal therefore still remains almost unrelated to the rural economy. I think one may say that the system has affected agriculture only negatively in that it has drawn talent from the country districts without sending any of it back into them ; that, as things are in Bengal, it is difficult to see how any very close relationship can be created between the higher educational system and the agricultural life of rural areas, until the primary and secondary systems have really begun to affect it; but that a beginning might be made on the lines recommended by the Sadler Commission, as soon as funds can be made available, it being clearly recognised that the work is not one for amateur control, and that above all things we must, by limiting numbers, and by ensuring that agricultural experts really control the Faculty, avoid creating anything in the nature of agriculturally trained unemployables.

This answer refers solely to institutions for general education.

(*b*) (*i*) It is very difficult to make suggestions, on the assumption that primary and secondary education remain in their present condition, and while finances in Bengal are so straitened. If the Bengal Bill for the expansion and improvement of primary education in the rural areas materialises into an Act, and the curriculum is kept related to the lives of the boys, there will be a rise in the ability and culture of the agriculturists without detriment to their practical life afterwards. In other words, the real solution is compulsory or at least widely extended primary education in the rural areas.

There are, of course, numerous palliatives. We could give the primary school teacher an increased agricultural bias by laying greater emphasis on school gardening and nature study at the training school. In rural middle and high schools we could introduce a certain amount of school gardening or agricultural training as a " practical arts subject " (subject to the limitations of finance). (There is a good example of what can be done cheaply at the Nawab Bahadur's Institution, Murshidabad). We could aim at ensuring that so far as possible the inspecting staff knew something of and was interested in nature study and agriculture in general. Whenever possible, schools should have school gardens and inspecting authorities should be instructed to commend instances of good work in this respect.

(*b*) (*ii*) In Bengal we have no experience of compulsory education in rural areas.

(*b*) (*iii*) The figures in Bengal of 1925-26 are—

Class I	917,850
Class II	276,289
Class III	180,400
Class IV	87,116
Class V	52,001
Middle	
Class VI	49,966
Class VII	41,259

There is a heavy fall between Class I and Class II, Class III and Class IV, Class IV and Class V. The fact is that the primary school is more or less used as a sort of *crêche* during the early infancy of a child. Such children spend a year or two in the school and then go away without learning anything, *i.e.*, as soon the boy becomes serviceable or domestically useful, he is kept at home. During the mischief-making period he is put in school under the care and protection of the *guru*. This accounts for the fall between classes I and II.

Class III marks the end of the Lower Primary Course. Poor people cannot afford to keep the child longer in school, as he has by that time attained an age when he is expected to help the father in the fields or to earn something for the family. This accounts for the fall between Classes III and IV and IV and V. It will be noticed that Class V marks the end of the Primary Course but the fall between V and VI is not great. It is difficult to say why. The reason may be that from Class V *bhadralog* class boys predominate and they continue. In the lower classes, the backward classes (including socially inferior and economically poorer classes) predominate. As soon as the boy becomes serviceable he is taken away, as the family cannot afford to keep him in school. In the case of higher castes and *bhadralog* classes, social prestige helps to keep the boy much longer in the school.

To prevent this sudden fall, this waste and lapsing into illiteracy, there is a real demand in Bengal for the revival of a public examination at the end of primary course in the belief that the boys will tend to stay on for this.

ral Evidence

23443. *The Chairman:* Mr. Oaten, you are Director of Public Instruction in the Presidency of Bengal ?—Yes.

23444. You have been good enough to provide the Commission with a note of the evidence that you wish to give. Do you desire at this stage to make any statement of a general character, or shall I proceed to ask you a few questions ?—I have said all that I have to say of a general character.

23445. Would you agree that the advancement of education bears very closely upon the improvement of agricultural practice in this country ?—I would go further and say that, in my opinion, it is indispensable.

23446. I see that you attach great importance to literacy as the main objective in the primary system of education. Do you think it is possible to infuse any agricultural bias, as it is called, into the system of primary education, without in some degree jeopardising literacy as the aim and object ? In other words, do you think the two are incompatible ?—No, I think the two can go together.

23447. As long as the idea of agricultural bias is not overdone ?—Yes.

23448. Do you attach importance to school gardens or school farms being attached to institutions ?—I attach very great importance to it. I think it is one of the regrettable features of the way things are working now, that there are so few of them, and what few there are have, on the whole, done badly; it is of very great importance indeed.

23449. Is nature study an easy or a very difficult thing to teach ?—I think it depends on the teacher's previous education. If he has had education in nature study with a certain amount of elementary science in it, it would be easy for him; but for the type of teacher we have it is impossible. Most of them cannot teach it properly at all.

23450. Is not teaching nature study to small children a very special art ?—Yes; it is better undertaken by ladies as in the West; it is difficult.

23451. Do you think it possible, within the financial conditions of the moment, to set up institutions in which school teachers could be instructed in the art of teaching nature study ?—It would be possible to teach a few how to teach nature study, but of course we are up at once against the fact that we are not teaching even a small proportion of the total number of teachers how to teach ordinary subjects. We cannot, under the existing financial conditions, train them even for ordinary subjects, let alone for special subjects of this kind.

23452. So that you regard the instruction of school teachers in this matter of nature study as an ideal which you do not see much hope of attaining in the near future ?—Not unless the Legislative Council can be persuaded to impose taxation for educational purposes, and of course, I would add, if the local bodies tax themselves also. If both local taxation and provincial taxation could be imposed, then we could tackle the problem, but under the present financial conditions we cannot begin to tackle the problem at all.

23453. How about the calibre of the persons who are coming forward for posts as school teachers ?—We can judge it from the standard of those who enter the *guru* training schools, which is very low indeed. In fact, one does not really instruct them how to teach but rather merely gives them the rudiments of education; that takes the whole time available, and they are very little more advanced than the pupils.

23454. Are the salaries that you are able to offer at the moment such as to attract the right type of men ?—No; the salaries are miserable. We aim at supplementing them; out of such sum as is available we give Rs. 2 to help District Boards to pay untrained teachers, and we give Rs. 6 to help the District Boards to pay trained teachers. There are additional sources from which they get something, but the total emoluments are not such as to attract anybody into the profession. It is only those who cannot get anything else that take it up, and even some of those who are trained in the *guru* training schools drift away from the profession; we lose even these whom we have trained.

23455. We have been talking about school gardens. Coming to school farms, is that a still more difficult problem ?—There you come up at once against the problem of finance. If the land is available, well and good, but in most cases it would have to be acquired and the expense would be prohibitive. It is difficult enough to get a site for a school, let alone for a farm.

23456. And the moment you undertake to conduct a farm, do you not come up against the difficulty of management ?—Yes; there is nobody to manage it under the present system.

23457. As regards secondary schools, you are familiar with the Punjab experiment. How long, do you think, it would take to provide in this Presidency persons capable of conducting secondary schools of a definitely agricultural nature designed on that line?—Under our scheme, we take 2 years to train an agricultural teacher, and we can only train very few, 15 to 20. It will take a very long time indeed to train many.

23458. But has not the proposal to institute middle vocational schools after the pattern of the Punjab experiment been accepted?—It has been accepted in principle by Government, but the funds have not yet been provided.

23459. Have you any idea as to how soon funds are likely to be provided? —I have heard that there is not likely to be much new money in the Bengal budget this year, but the popular interest in the scheme is considerable, and I think Government will find the money for it, especially as the amount required for the first year will be very small. I think we shall make a start in training teachers in January 1928.

23460. Would you tell the Commission whether you attach importance to female education? —I attach great importance to it, realising, at the same time, the enormous difficulties of making any great advance. In secondary education I do not believe that there is much chance of attracting a large number of girls to the present type of secondary girls' schools, because people seem to have very little faith in them. I have suggested that a special type of girls' school very different from the present is necessary, if ever we are going to attract many girls into our schools. I was rather thinking of a type which does not train for the Matriculation or any University examination, but which aims at general culture and some knowledge of useful domestic arts. The examination should not be the main aim. I advocated these ideas a year ago in a speech at the Bethune Ladies' College, and, as a result of that, the question has been taken up all over India. A conference is being held in Poona to discuss women's education this month or next month, with representatives from different Provinces. So much for secondary education. In regard to primary education, while realising the enormous importance of educating girls, one realises that at present much of the money spent on educating girls is wasted, more or less in the same way as in the case of the boys' schools; they suffer in the same way; they go away early, and so on. I would answer your question by saying that I attach great importance to female education, but the difficulties are almost insuperable.

23461. Are there difficulties in recruiting and maintaining women teachers? —Yes, there is not a very large supply; it is very difficult to get them to go into rural areas and live there.

23462. *Professor Gangulee:* You have women teachers in Missionary schools? —Yes.

Rai Bahadur Bannerji: In other schools as well.

23463. *The Chairman:* You think that female education is not likely to increase to an important extent until you do have women teachers?—With the present social system, I do not see much hope of many women teachers coming forward.

23464. You attach importance to adult education? —Yes; so far as it can be done it is desirable to have it as much as possible.

23465. Have any attempts been made to advance the cause of adult education in the Presidency? —I do not think there has been any strong movement or any special effort, mainly owing to the lack of money. The District Boards help, of course.

23466. If such an effort has been made, it would be very valuable to the Commission to have the particulars,* even although the experiment may have failed. You attach importance to adult education, if it could be achieved, as a means of impressing upon parents the value of education for their children and as a means of avoiding the tragedy of a child who goes to a primary school for a short time and then returns to an illiterate home? —I quite see the point of educating the father; you probably educate the son by educating the father; you create double effect by making the father literate.

23467. In the present state of the educational budget, I understand you do not feel disposed to spend money in the direction of adult education? —It is only a question of their relative importance, the best way of spending the money. I quite see the point that it might be better to educate the adult than the child. That is rather a new point. I think that if the Primary Education Bill comes forward, it will certainly have to take up the question of the education of adults as well, if there is money for it.

23468. As the proportion of literates to illiterates in the population rises, the demand for adult education, even if the public demand were at its highest potential, would of course be reduced year by year, would it not? —Yes.

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* *Vide* Appendix.

23469. So that if it is true that an attempt at adult education would assist the cause of literacy amongst the children, the expenditure on adult education would be on a decreasing scale ?—Yes.

23470. Do you think there is a place for the educated youth in agriculture in this Presidency ?—Generally speaking, my impression is that there is not.

23471. Why ?—Because of the lack of any custom of employing such men. Even if such men were available, I think there are not many openings.

23472. I was wondering whether you attached any importance to the smallness of the holdings available ?—I was thinking of that point, that there is no room for the highly educated expert.

23473. Because of the small size of the holdings ?—Yes.

23474. On page 453 of the note which you have been good enough to give us, you suggest the raising of examination standards in secondary schools. How have these examination standards moved since you have been familiar with the system ?—I was thinking of the Matriculation and my opinion is that the standard has certainly gone down in Bengal. Now, for instance. the standard of the Bengal Matriculation is much lower than, say, that in Madras.

23475. Has that downward movement been effected in deference to public opinion ?—It is difficult to say what it is due to ; but public opinion certainly likes to make the passing of examinations easy and certainly during the last seven or eight years I think there was a policy, whether, deliberate or not, of making it easy to pass the Matriculation.

23476. Public opinion now supports the movement for the raising of the standards ?—Standards were raised last year and as a result admissions into colleges were less.

23477. Have there been complaints about that ?—No. Such teachers as I have met have deplored the easiness of the Matriculation. One reason they gave was that it was impossible to make boys work at all. Certainly the teachers are against the lowness of standards.

23478. Are you in favour of compulsory education in this Presidency ?—Definitely yes, subject to the proviso that it is practicable and whether it is practicable we can only tell by experiments. Our Primary Education Bill of course does not propose to bring in compulsory education immediately, but the Unions can make it compulsory in their areas.

23479. It is permissive at the discretion of each Union ?—Yes.

23480. Now, under a system of compulsory education this tendency to withdraw children from the primary schools before they have passed through the various standards would entail waste of public money, I suppose ?—Under a permissive system ?

23481. It is to be permissive at the discretion of the Union, is it not ?—Yes.

23482. In districts where the Unions have decided to adopt the compulsory principle, every child sent to school involves the expenditure of a certain amount of public money, and if it is withdrawn by its parents at too early a stage that money is wasted ?—Yes.

23483. Has it ever occurred to you that it might be worth considering some scheme by which parents would be invited to contract in to a compulsory scheme ? By " contracting in " I mean that the parents who have decided that their children ought not to be educated would be allowed to keep their children away from the school but those who decided to educate their children would have to contract in to the scheme. The encouragement to keep their children in school might consist of a fine to be levied in the event of the child being withdrawn before the proper time, and that fine might be on a descending scale, so that the longer the child is left at the school the smaller would grow the penalty ?—Yes ; that is interesting ; but what is the primary inducement to him to make the original contract ?

23484. To have his child educated. It would cost him nothing if he kept his contract, would it ?—No ; the idea is this that in this way you would find out roughly how many you have got to put through the system.

23485. Has any scheme of that sort ever occurred to you ?—No ; that is a new idea to me altogether.

23486. One might put the case for it in another way and ask whether you would agree that it would be on the whole to the advantage of the public if a smaller number of children went to school, if that smaller number were properly educated ?—Yes ; I agree thoroughly there.

23487. Where are your Normal schools situated?—We have six, five of them being Government and one non-Government. They are in Calcutta, Chittagong, Krishnagar, Dacca, Rangpur and Hooghly.

23488. Do you attach importance to the locality in which these Normal schools are situated in relation to the training of teachers for work amongst the rural population?—May I get this point clear? We use the term 'Normal schools' in a rather technical dense; you are perhaps referring to the primary training schools?

23489. I am, if I understand the position aright?—Our first grade Normal training schools are only six; but we have also the primary training schools and there are about 100 of those—the *guru* training schools.

23490. Then, is the adoption of the Punjab scheme going to involve expenditure on a special training institute?—They are going to be trained at the Dacca Agricultural School here.

23491. *Professor Gangulee*: Where are these *guru* training schools situated, in rural or urban areas?—Both; some are in towns and some in rural areas. The newer type we are constructing is in towns but the older ones are in the country.

23492. *The Chairman*: Would you like to see a Degree of Rural Economy instituted in your Universities? Would you attach importance to that?—I would not attach primary importance to it, but as money becomes available I should like to see that started. I should certainly like to link up these things with the University.

23493. *Sir Henry Lawrance*: In regard to the education of girls, have you got any women Inspectresses?—Have you got any women staff here at all?—Our lady inspecting staff consists of two Circle Inspectresses, one for Western Bengal and one for Eastern Bengal, and there are twelve Assistant Inspectresses. Of these Circle Inspectresses one is an English lady (the one in Dacca) and the other is an Indian lady (the one in Calcutta) and the twelve Assistant Inspectresses who are in the Provincial Educational Service are Indian ladies.

23494. Are the two Circle Inspectresses in the Imperial Service?—Yes; they are in the Imperial Service.

23495. How many schools have they got to inspect, a considerable number of them or very few?—I am afraid I have not got the figures at my fingers' ends at the moment, but they inspect of course such few secondary schools as they have. There are many primary schools and they cannot inspect them all; the Assistant Inspectresses do this.

23496. Is the primary duty of the Circle Inspectresses to inspect the secondary schools or to inspect the primary schools?—Their primary duty could not be to inspect secondary schools because there are so few secondary schools; very few indeed.

23497. Then you spoke of the Primary Education Bill. What is approximately the figure for the revenue that would be secured by this?—There are no exact estimates, but I think the figure is estimated to be somewhere in the region of 80 lakhs, speaking from memory, and the whole problem cannot be tackled with that because the estimate we have for the total cost of a compulsory system is somewhere in the region of 200 lakhs.

23498. At present the expenditure of the State and of all local authorities in Bengal is a little under a crore of rupees?—On all types of education I think it is something like 120 lakhs.

23499. The figure given in the last review of the Government is 93 lakhs?—I do not know, I do not think I can reconcile that. But speaking from memory I think it is 120 lakhs.

23500. *Mr. Gupta*: Does the 93 lakhs include European education?—No, it does not; there is another 11 lakhs for European education to come in.

23501. *Sir Henry Lawrence*: According to these figures, 31 lakhs is being spent on primary education?—Yes.

23502. Now this new Bill would deal with primary education only, would it not?—Not only would it be confined to primary education, but it would be united to primary education in rural areas; it does not touch Municipalities which can work under the existing primary education provisions if they like, involving contributions from themselves.

23503. Then, if there is some hope of getting 80 lakhs, it will be a very big step forward?—A very big step forward.

23504. Nearly trebling the present expenditure on primary education?—Yes.

23505. You say, "If this Bill comes forward." What is the doubt about it?—The position is this that we shall have a Minister next week I suppose, and he will have to

decide what his primary education policy will be. When a previous Minister took office, I remember on the very first day he said "I must do something for primary education," and asked our opinion. We had not then a Bill ready. We have now a Bill ready, and the Minister will have to decide what he thinks best and suggest modifications. I presume any Minister must, with some modifications if he thinks fit, put the Bill before the Council, where, in my opinion, it will be cut up mercilessly and probably have to be withdrawn as being cut up too much. That is my prognostication of the probable course of events. But I think, the Bill being there, the Minister will have to take some action on the Bill, either in its present form or with such modifications as suggest themselves to him.

23506. At present, in Bengal the expenditure on University education is somewhat higher than that on primary education ?—It is relatively very high indeed, yes.

23507. And expenditure on secondary education is nearly as much as on primary ?—Yes, that is a point we have realised a good deal during the last two years, and, on the whole, our policy in the Department now is that any new money available should be spent as much as possible on primary education. I do not say that that opinion has been recorded in any formal Government Resolution, but that is the general trend of opinion in the department.

23508. I have some figures here with which no doubt you are acquainted. Ten years ago the expenditure in Bengal on primary education was 50 lakhs, while in Bombay it was just under 70 lakhs. In these ten years Bombay has added 1 crore to the expenditure on primary education while Bengal has added 10 lakhs; so that what you now propose to do in your Primary Education Bill is somewhat similar to what has been gradually done in these ten years in Bombay ?—Yes.

23509. But would you agree that at present the expenditure on University and secondary education is out of all proportion to the amount spent on primary education ?—I agree thoroughly and it is of course due to the fact that such public opinion as there is is that of the middle class which naturally wants money spent on secondary schools and Universities which benefit themselves. There is a vague public opinion, of course, in favour of primary education, but when it comes to a choice as to whether money shall be spent on a new school or a new college or on primary education, the whole of public opinion is in favour of spending the money on secondary and University education.

23510. That is public opinion as represented by the present franchise ?—I was not thinking so much of actual votes as of the pressure of public opinion, though doubtless it does express itself to some extent through the franchise. But the lowering of the franchise qualification, as it has been lowered, has not really had a chance to affect the situation much yet; the franchise certainly has gone very low, but I do not think that translates itself into a demand in the Council yet; it may in time. I may mention that when the principles of this Bill were discussed, there were some Swarajist Members who said they were extremely pleased with it and meant to push it as representing the wishes of their constituents, many of whom are down at the very limit of the lowest franchise; but whether that will translate itself into action in Council I do not know. I remember that certainly a good deal of Swarajist support was expressed for the general principles of the Bill, involving, as it did, heavy taxation of zamindars. That provision has, however, been modified in the Resolution. The zamindars are not going to be heavily taxed while the ryots are. The original idea was half and half, it is now 4 pice to 1 pice, the ryot paying the 4 pice. The original idea of half and half was modified in the Executive Council before the Resolution was issued.

23511. *Dr. Hyder:* In the Executive Council, not in the Legislative Council ?—No, it has not been before the Legislative Council yet. The Resolution was drafted in the Executive Council and the original idea of half and half was modified to 4 and 1.

23512. All the cesses levied so far have been on the basis of half and half ?—We have not levied any yet.

23513. I am referring to cesses for public works ?—I am afraid I do not know; Mr. Gupta can probably tell you better than I.

23514. *Sir Thomas Middleton:* I want you to tell me something about the position of the village schoolmaster in Bengal. What is his ordinary pay ? You have, I think, indicated that it is very small, but at what rate does he start and at what rate may he expect to finish ?—There is no incremental rate. Mr. West probably will tell you more about details of that kind, but I imagine he does not get much more than Rs. 11 a month to live on.

23515. Is that the average ?—It is too high for an average.

23516. There is no system of graded payment for long service ?—No. As I said in my note there is no system really.

23517. Is he a member of the village community, or does he live more or less a life apart ?—I believe he lives rather a life apart, I believe he does not form part and parcel of the village life.

23518. Then his position is not very enviable ?—No.

23519. You remark on the first page of your précis that if Bengal can afford the taxation necessary for the system which you have in view, it will be repaid a hundredfold. You are thinking in this case entirely of a system of primary education ?—Yes.

23520. And you are thinking of securing literacy in a large percentage of the pupils who enter primary schools ?—Yes.

23521. At present I understand the position is that a relatively small percentage of those who enter ever attain literacy ?—I imagine that out of the number who enter one-twentieth to one-thirtieth attain literacy.

23522. Your conception of a satisfactory system would result in what percentage becoming literate. I want to know your aim ?—My aim is cent. per cent. of course.

23523. You hope to get cent. per cent. ?—Possibly in a hundred years ; I do not know when, but ultimately.

23524. They will be able to read and write and figure when they leave school ; five years after they leave school what percentage will be literate ?—It depends entirely on whether other ameliorative agencies go forward at the same time ; you need village libraries and all sorts of activities of that kind.

23525. I think one of the witnesses has pointed out that at present a boy who leaves school has really no chance of remaining literate, because he has got nothing to read ?—That is the point ; but that need not be the case in the not very distant future if other agencies are utilised for providing such reading matter.

23526. Do you not think that, even if there were a library, there is a danger that a large percentage may not use that library ?—I was not thinking of a library so much ; I imagine if he becomes literate, like the Westerner the villager will read a newspaper in time.

23527. That brings me to a point on which I wanted to question you. I think all are likely to admit the great value of literacy to agriculture, but how will it work ? How in your opinion will literacy effect the improvement of agriculture ?—Bringing it down to the concrete, I suppose if he could read he could read seed catalogues, for instance.

23528. That is what you were thinking of ?—That is one thing ; I imagine he could read elementary treatises or pamphlets which would be distributed by the Agricultural Department, and so on, which at present he cannot do. In that way he will get new ideas, just as the Australian farmer reads an agricultural journal every week.

23529. The Australian farmer may, but there are other countries in which the farmer can read but does not read such journals ?—Yes.

23530. Do you think that in Bengal the desire for agricultural knowledge is such that if they could read they would read such publications as, for instance, are issued by Mr. Finlow's department ?—I hope so ; I admit I am a bit vague on the point.

23531. What other sources of information would be open to them ? You mention the newspaper ; do the newspapers in fact attempt to give much agricultural information ?—I was not thinking of that side of it. I was merely thinking that they would read newspapers in time, with the growth of political life in this country, and that that would keep them literate. I was not thinking of agricultural information being conveyed through the newspapers, though in time I imagine it would be, and, as in other countries, the newspapers would contain a certain number of articles on subjects of interest to farmers.

23532. Then it has been pointed out to us that one of the difficulties in Bengal, and in adjacent Provinces, is that once a boy has become literate he no longer wishes to have any connection with the land ?—That is a stage we have got to go through, it has been gone through in other countries, and it has got to be gone through in this, I think. The ordinary boy in England does not leave the land because he can read. I admit that literacy does tend to take people away from the country ; that is naturally so, because they can get more enjoyment in the towns.

23533. But that is not an aspect of the subject to which you think we need attach much importance in Bengal ?—I do not want importance attached to it if it is going to be used as an argument against literacy ; I think it is a stage we have got to go through and risk it.

23534. For instance, in connection with secondary schools, you talk of the pick of the rural areas being taken by the towns and I am asking myself whether there might not

be some danger of the same kind arising out of improved primary education ?—I fully admit the danger, but I am not prepared to admit as a conclusion that we must stop education to avoid it.

23535. It occurred to me as an answer to my question that if secondary schools do, in fact, take the pick of the population away from the rural areas, you have plenty of people to pick from and plenty to live in rural Bengal, so that there is really no serious danger ?—That is so.

23536. You favour compulsory education if practicable ?—Yes that is my standpoint.

23537. In your answer to Question 23, you point out one of the practical difficulties which confronts us; boys at present leave at class III stage largely because parents cannot afford to keep them at school any longer ?—Yes.

23538. What is going to happen to such parents when compulsion is adopted ?—Whether that difficulty can be overcome will have to be considered; I think the only way to get over it is to have schools in the morning or evening, or at such times and seasons as he can be spared.

23539. Under a compulsory system you would be prepared to favour and aid such morning and evening schools ?—Yes, every local authority, every district committee, every union, would have to make varying rules to meet the needs of the locality.

23540. You are prepared to permit a greater degree of elasticity than we are accustomed to, for instance, in England ?—Yes, that is inevitable.

23541. With regard to the demand for agricultural education in Bengal, do you think that any real demand for agricultural education does exist among the villagers ?—On the whole, I should say not, but I am not really well qualified to answer that question.

23542. So the famous answer given in connection with female education applies also to agriculture ?—What is that ?

23543. Female education is carried on in response to a demand that does not exist ?—Yes, I think there is a lot in that, but still I would leave others to answer that question.

23544. You obviously have no very great hope for the development of female education in Bengal in the immediate future. At any rate that is what I gathered from your answer ?—No.

23545. Have you attempted anything in adult female education ?—Not very much.

23546. The experience in other countries is that until they get educated women on their side they do not make much progress. And I understand that especially in a Bengal household elderly ladies have a great say in disposing of the affairs of the household ?—Yes, that is so. The fact that our secondary system is so essentially a foreign system has tended, I think, to keep alive the idea that education is a thing for men and not for women. If we could once get the ladies on our sides we should win the battle.

23547. But at the present time although you have lady Inspectresses you are not getting much done in the way of getting at the women themselves, I mean the adult women ?—No.

23548. *Dr. Hyder :* As the question of finance bulks largely in your answer I am going to question you about it. I find from this Resolution which has been appended to your written replies that your Government spend about 92 lakhs on education generally and one-third of that is devoted to primary education. May I know whether the bulk of that money is or is not raised from the agriculturists ?—Yes, I should say that the bulk of the money raised in Bengal must be from them because Bengal is primarily an agricultural country and money must naturally come from that source mainly.

23549. Government raise their money from the agriculturists and spend only one-third of that revenue directly on the agriculturists, whereas two-thirds are used for the benefit of other classes ?—The middle and upper classes.

23550. Now with regard to this policy of spending two-thirds of the revenue on one set of people and one-third on another, I want to ask you whether there is any return made to the industry from which the money is raised ?—I made it clear in my note, I think, that there is practically no connection between the two. We have already revolted against it.

23551. Since when ?—I think about two years ago and Sir Abdur Rahim had something to do with the revolt. It has not shown itself in practice as yet because we have had no money since then.

23552. Supposing you did not levy a cess but wanted to divert the funds from University and secondary education mainly to primary education, do you think your Minister could carry through such a policy ?—Translated into concrete fact, it means taking away

the living of many middle-class teachers in schools, and I think that the pressure both in and out of the Council against that policy would be irresistible. I am well aware of the general idea; theoretically such transference of funds would be a good thing. It was proposed, I remember, by the Phillipine Commission. They proposed, if I remember aright, that the fees in academic high schools should be raised so high that the cost of academic education would fall almost entirely on the parent. I fear that Bengal as a whole would be in favour of keeping the money for the University and the secondary schools, and I do not see any chance of carrying a policy like that through.

23553. With regard to the question of agricultural improvement, I suppose the views of Mr. Birley as given in the Calcutta University Commission Report are familiar to you?—With regard to what?

23554. With regard to agricultural improvements and this question of education?—I remember the note, but I am afraid I do not remember the details.

23555. I shall put them before you. It is said that the landlords of Bengal are interested only in a few minor improvements; they are not interested in the improvement of crops because the benefit of raising additional crops would go to the cultivators to the extent that these rents are fixed in money. So that you have here in Bengal a curious state of affairs; firstly you raise money from one set of people and spend it ultimately for the benefit of another set. Then you are faced with a cross-current of opposition which is of the opinion that whatever little money is being spent on primary education should be diverted to other sources because it is much better that these people should remain ignorant and in the state in which they are?—I have heard that theory put forward, and I think that there is something in it. One does know that there is a certain fear among the upper classes in this country of the lower classes being educated.

23556. With regard to the question of finding employment for graduates in agriculture, for instance, in an institution which the Director of Agriculture might establish, it is of course a fact that the size of the holding is small, but do you not think that there would be some room for these graduates as estate managers? The size of an estate and the size of a holding are two different things, are they not? Could you not find room for these people if they looked after a large number of such small holdings?—I am afraid there are many people in a better position than myself to answer this question as they would be more closely familiar with the details of land tenure. But theoretically I agree that might be the case.

23557. You say that this question of raising 4 pice from the tenant was modified in the Executive Council?—Yes. The original draft Bill contained 2 pice and 2 pice and then it was modified.

23558. I wonder if you could tell us whether all these cesses levied in Bengal have been levied hitherto on the basis of half and half?—Yes, I think that is so.

23559. Can you tell us the reason for the change?—I am afraid that in my official position I must leave you to guess, it is not very difficult.

23560. *Mr. Gupta*: Before I ask you any questions, I would like to have one or two points cleared up arising out of your replies to the questions put to you first by Sir Henry Lawrence and then by Dr. Hyder. Now in connection with the comparatively small amount which Bengal is spending on female education as compared with Bombay, are you aware whether in Bombay there is any special tax for primary education, or whether the money is found from the general revenues?—I cannot say.

23561. There is no tax in Bombay as far as I know, and I speak subject to correction by Sir Henry Lawrence. Is this proportion entirely due to the fact that more money is spent on higher education, or is it due to the fact that much more money is being spent on education as a whole in Madras and Bombay than is the case in Bengal?—I will give you the figures. Madras is spending two crores on education; Bombay also is spending two crores, whereas Bengal is only spending a crore and 36 lakhs, so that the total expenditure on education in Bengal is only about half of what is being spent in either Bombay or Madras. It is therefore not because we are spending more on University and secondary education that we are able to spend so little on primary education, but because the total expenditure in Bengal is much less than it is either in Bombay or Madras. From these figures which I have before me I see that we are spending more money on University education in Bengal as compared with either Bombay or Madras, but at the same time the fact remains that much more money is being spent on education in Bombay and Madras than in Bengal. And I suppose you also know that our total revenue per head is very much less, nearly one-third of what it is either in Madras or Bombay, and one easily sees that that is probably one of the reasons why there is this great disproportion on the whole.

23562. The second point which I wish to put to you is in connection with the answer you gave to Dr. Hyder when you spoke of revenue from agricultural classes. You are not familiar with the income derived from Excise, Stamps and other sources, are you ?—No.

23563. You simply spoke from your general knowledge ?—Yes.

23564. Then about this Primary Bill. You have said that, if the Bill comes forward, the apprehension is not so much as to whether the Bill is going to be accepted by the Government as it is but whether it is going to be put through at all ?—I may be wrong, but I do not think that the Council would go so far as to throw it out altogether. My point was that it might be modified in such a way as to be unacceptable to the Minister in its final form when it is brought up before the Council. But I am not afraid of the Bill being dropped altogether in the first instance.

23565. Does the Primary Bill exclude compulsory female education altogether ?—I think it includes girls' education, but it does not include the compulsory education of girls.

23566. Now with regard to adult education. Are you not familiar with any of the night schools where grown up people are taught ?—I am tied to the office a good deal and I have not actually visited any.

23567. With our resources as they are at present, are there any ways in which you might improve the system ? If you are a pessimist, I can understand that. Our financial position is not at all satisfactory; but if we had a system of concentration to which reference has been made by another witness, and fewer schools of a better type, would that improve matters ?—You mean fewer schools of a better type for males ?

23568. I am talking of primary education for boys. Instead of fixing our grants, for instance, for about ten schools in a Union, do you not think it would be better to give Rs. 25 to two good schools rather than give Rs. 4 or Rs. 5 to ten schools ?—Certainly the system of having a school in every village is hopeless. If anything is to be done, you must do away with this system.

23569. *Sir James MacKenna*: Have you any acquaintance with the scientific side of the University of Decca ?—No, I have not seen much of Dacca University. I have been up here very little.

23570. You are not on the Senate ?—I am on their Court which holds only an annual meeting and I have not found time to attend.

23571. I was going to follow up the scientific side of the Dacca University with reference to the proposed Agricultural Institute, but as you have no acquaintance with it I will not do so ?—I cannot say I am familiar with it.

23572. *Professor Gangulee.*—I want to ask you one or two questions about primary education. Do you agree that the demand for compulsory primary education has come to stay in Bengal ?—The demand has come to stay but the question is whether the people are willing to pay for it. The demand is there. I think it is national self-respect that brings about that demand now as much as anything.

23573. If you had adequate financial assistance, would you have more schools or would you remodel your existing schools on a sound basis ?—At the moment, if you have any scheme for compulsory education you must have more schools; but if you have anything less than a compulsory education scheme, then it is a matter of remodelling; in any case some schools must become central schools in order to serve several villages.

23574. The point is that the mere expansion of schools does not ensure the success of the educational movement ?—I agree.

23575. In this note of yours, you lay emphasis on the importance of having adequate finance and you also mention that the primary defect in your education system is the lack of a system. You say in your note, "it is not so much a change in the system as the creation of a system which is needed." I should like to ask you to tell the Commission very briefly how you would propose to create a system ? What would be your first step ?—The first step would obviously be a survey of places where schools were needed. Secondly, you would have to find out how many pupils would go to them. If you had a compulsory system it would be fairly easy to find out the number of pupils. The survey would also enable you to withhold grants from such schools as were not needed.

23576. Has any such survey been made at all in Bengal ?—No. Mr. Biss made a sort of survey and he came to the conclusion that Rs. 2,00,00,000 was required for a complete scheme. But I imagine that in the case of the survey which I propose each district would make its own arrangements; it would not be an all-Bengal survey.

23577 What would be the nature of the information that you would like to seek in these surveys that you contemplate ? What would you actually like to find out ?—You will have to find out how each village lies and where the schools serving those villages

should be established. Mr. Biss put out a scheme but he did it with circles and half mile areas and so on. You will have to survey the villages and find out where the schools should be.

23578. First you say there ought to be an educational survey and the second step you mention is to raise the funds ?—Yes.

23579. Then, given the necessary funds, you would evolve a type of administration. That, I suppose, would be the third step ?—I think each District Committee would have to appoint its Educational Adviser to start with.

23580. In your note I find that you propose to have a District School Board ?—The Bill contemplates each district managing its own affairs by means of a special *ad hoc* District Committee and the first thing that this committee would do, would be to appoint an Educational Officer or Director or whatever you may call him.

23581. He would be the controlling authority of all the Boards ?—He would be the servant of the District Committee.

23582. So, you would have an educational officer in each district ?—Yes, because it would be a big problem. Just as the Corporation of Calcutta has its own educational officer, so each district would have an educational officer of its own.

23583. Would all these officers be under the Minister or under the Director of Public Instruction of Bengal ?—I should like to see them under the District Committees. They would be the servants of the District Committees.

23584. They would have nothing to do with the Local Government ?—Certain aspects of the District Committee's work would be subject to the sanction of the Local Government but I see no difficulty in the educational officers being the servants of the District Committees.

23585. You would have the educational officer under this *ad hoc* Committee ?—Yes.

23586. Do you think the District and Local Boards have, as they exist now, shown the necessary ability for administration and supervision of rural schools ?—They have not but the *ad hoc* Committee is quite different from the District Board.

23587. In the case of these *ad hoc* Committees, how would you safeguard them against the influence of partisan politics ?—There is a fair official element on these Committees. Of course, the officials are not in the majority, but there is a large official elements including the District, Magistrate.

23588. That would be resented by the public opinion ?—If there were an official majority it would be challenged in Council; but this is not the case, so it should not be resented. There is a non-official majority under our proposal.

23589. In the event of there being a non-official majority, there is likely to be some difficulty with regard to the influence of partisan politics ?—I think the official element would balance the two.

23590. With regard to the question of finance what is the present system of distributing grants to primary schools ?—The District Inspector through the Sub-Inspectors draws up what he thinks is the right distribution of grants and the scheme goes before the District Board and is generally sanctioned as it stands.

23591. You do not follow a system based on any definite policy ?—We have to rely on the District Inspector to be wise in his suggestions ; that is all.

23592. Could you tell the Commission your views on the system of small grants-in-aid that you have in this Presidency ?—You mean the policy of supporting small schools here and there ? I think it would be a good thing if it were possible to alter it.

23593. I mean giving Rs. 2 here and Rs. 3 there and so on ?—That is a defect in the system. Whether it could be changed or not, I do not know.

23594. Would you agree that the system is defective ?—Yes. The reason is that if you close these small schools by taking away their grants and improve a school a couple of miles off, the children will not go to them at all and that is the reason why you require these small grants. You have got to have a school close by. Unless a school is near, children will not go to it.

23595. I think you have rightly laid emphasis on the fact that money is the main factor. The other day I was going through an American book where I also came across the same remark. I think to get the right sort of teachers is also a problem and you have already made reference to it in your note. I should like to get more information from you about *guru* training institutions. Who are the teachers that teach the *gurus* ?—In the new type of *guru* school we have a staff of three. One is the Head master, who is a graduate and B. T. and the other two are vernacular trained teachers. Their task is as I said before, to teach the *guru* not so much the principles of teaching which we would like to but simply to complete his own education.

23596. How long do they stay ?—For one year only.

23597. How many of them are in each of your schools ?—The number of *gurus* in the old type of schools is less but the new type of schools contains forty.

23598. With regard to the inspecting officers, that is another link in the system that has got to be perfected. What is the present arrangement here of your inspecting staff ? What are their qualifications ?—The Sub-Inspector nowadays has to be a graduate and have a degree in teaching and also some experience of teaching. We relax the degree in teaching in the case of Mussalmans because we cannot get them with it always. We have to accept a lower standard in the case of Mussalmans but that is only temporary.

23599. The last link must be the change of curricula. You say in your note that when a real step forward can be made in rural primary education, the question of curricula will be of first rate importance. Could you tell the Commission how you propose to deal with the question ?—It is not a question which we have taken up yet, but the Bill contemplates a rather radical departure by including religion ; that is one point. Secondly, I personally would like to see music taught in every primary school. I think the absence of music, which is after all the nation's heritage, from schools is a very bad thing indeed and compares very badly with Western ideas of education. Of course nature study, *i.e.*, some simple form of science must also be included. We must also have reading, writing and arithmetic. There might however be local variations which the District Committees might suggest but we must certainly have reading, writing and arithmetic.

23600. Who would decide the framing of the curricula and the system that we have just discussed ? Would it be the Provincial Government or the different District *ad hoc* Committees as suggested by you ?—All these matters are not yet worked out, but I would suggest that, instead of having one unified curriculum, the different districts, if they desired specialised curricula of different kinds, might have their own curriculum. In the beginning, however, we should doubtless have the existing provincial curriculum.

23601. The position is this, that you have a Bill and you propose an educational cess to get the necessary funds for the purpose, but you have not developed the system yet ?—We have only as yet framed the administrative skeleton. The Bill may not become an Act for the next five years, and it is no good working out detail until the frame-work is settled. Even if the principles of the Bill are accepted by the Council, it will have to be brought into effect by executive orders at such times as may be suitable. It will take long before it can be got going and we have to train the teachers to start with, before we can begin.

23602. *Mr. Calvert* : On page 453 of your first note you say, "the cultivator's son is taking advantage of the system of higher education." Is he now being employed more and more in your department as a teacher ?—No, I should not think that many of them are coming in yet, because they are not naturally the brightest of the people, and I imagine that the qualifications they obtain are generally less than those of the others ; so they do not meet the upper class man in competition yet.

23603. Is it part of your policy to get as many of them as possible ?—We have not adopted that policy yet. Perhaps I should point out that there are no Government posts in primary schools. The Government teaching posts are in secondary schools. A lot of cultivators' sons go in for primary education, but we do not appoint the *gurus*. They just start a school, or get employed in a school ; the department does not employ them. The schools recruit their own people.

23604. The Government Resolution of 25th September 1926 puts the cost of primary education at about Rs. 31 lakhs. Have you any rough idea as to how much of that is spent in rural areas and how much in urban areas ?—I could not say without reference to papers.

23605. The cost per student in a primary school works out at Rs. 1-14-0. That is, I gather, the cost from public funds ?—Yes, from taxation.

23606. Can you give us a rough idea of the total cost from all funds of primary education per pupil ?—I should have to look it up.

23607. In the Punjab, it is Rs. 10 per pupil. Rs. 1-14-0 is only a very small proportion of the total cost ?—I do not think it would be anything like Rs. 10 in Bengal. It might be in the region of Rs. 4, but I am not quite sure.

23608. Have you any idea as to what the proposed cess of 5 pice in the rupee of the annual value of lands amounts to per acre ?—No.

Dr. Hyder : 5 pice per rupee of rent paid, I think

23609. *Mr. Calvert*: Is the annual value the same as the land revenue here?
Dr. Hyder: No, the rent.

23610. *Mr. Calvert*: In your note, generally, you say very little about the teacher of the primary school?—Yes.

23611. It is not because you under-value the position of the teacher?—No; I think I appreciate him.

23612. Do you not think that the wastage in the higher classes may be due to the inefficiency of the teacher?—Undoubtedly, it is due to that; many parents think it is not worth the trouble their boys continuing.

23613. You suggest a good primary school teacher with an increased agricultural bias?—I should like to train him better at the *guru* training school in elementary science and nature study, and so on. It will add to the cost, but it might be done without adding greatly to the cost by taking one of the *guru* training school staff and having him trained in agriculture.

23614. If you had a better type of teacher, with more rural sympathy, do you think he would be able to diminish the wastage in the higher classes?—I should certainly think that the better the teacher and the more his teaching is in relation to the lives of the people, the more the boy would tend to stay on.

23615. You also suggest that you might ensure that the inspecting staff should know something of agriculture. Is it part of your policy to select your inspecting staff from the sons of cultivators?—We have not adopted any policy of that kind.

23616. Do you think it is possible to give an urban-bred teacher an agricultural bias?—I certainly think that an urban teacher who had gone through a training in agriculture could help the schools in his charge.

23617. I was not quite clear on the suggestion from the Chairman of "contracting in." I gather, and I think you yourself have stated somewhere, that about 3½ per cent. of your total pupils reach the fifth class?—Yes.

23618. That means a very considerable wastage in the first two classes?—Yes; you can see that from the figures. It is 917,850 in Class I, and it goes down considerably afterwards.

23619. Would it be possible to make it a condition of a boy entering school at all that his parent should agree to send the boy to school up to the full school-going age?—If it is free education. That is the only incentive you can offer him. I do not think it is an impossible suggestion; it is a new one to me, and I shall have to think over it, but it does not seem to me to be impossible.

23620. Does your department attempt to work in close touch with the Co-operative Department in this matter of rural education?—We have not had much inter-connection at all.

23621. You do not utilise the Co-operative Department as a means of securing better attendance?—No.

23622. Do you try and get the staff of the Co-operative Department to lecture in schools on co-operation and rural economics?—No.

23623. Do your teachers obtain any training in rural economics?—No.

23624. There is mention in the report about Moga. Have you, as an expert, any view to give on the value of Moga?—I have referred to it in my note. I have said that in Bengal I should like to see the experiment made where the conditions exist. I have not seen Moga myself, but I have read about it, and I should like to see in Bengal many more schools on the lines of the Moga school. The essentials of such a school are very competent guidance and a residential system; also, a good deal of land is necessary. Certainly, I do believe in an increased number of schools on the lines of the Moga pattern. We are going to have one in Chapra in Nadia district; we have the machinery there.

23625. For the Moga system you would require a rather better class of teacher than you have at present?—Undoubtedly.

23626. The teacher is the real crux?—Yes. We have an analogous experiment in the Midnapore district; it is not agricultural, though; it is mainly industrial.

23627. *Professor Gangulee:* That is run by Missionaries?—Most of such schools are run by them. Competent guidance is the essential thing.

23628. *Mr. Calvert:* On this question, I was just wondering how far the problem is financial and how far it is the teacher?—Both, because without finance you cannot attract the right man in the profession.

23629. Much money is wasted on classes I and II ?—Yes.

23630. If there is the money it could be better spent ?—Yes.

23631. And the spending would be on the teacher ?—I do not quite follow that. You mean to say that we should teach a fewer number of children than we are teaching at present.

23632. You should get more boys for classes IV and V; that is important ?—Yes; and in desperation we are thinking of attempting to do something by having a public examination for Class V.

23633. *Professor Gangulee:* Do you think that it will make the boys stay on ?—Yes; parchment certificates are considered to be valuable in Bengal and the hope of getting one by passing the examination could induce many to stay on. We had the examination before but it was abolished, and we are thinking of reviving it.

23634. *Mr. Gupta:* That would keep them on for a longer period ?—With a view to getting the certificate they would stay on in many cases.

23635. *Mr. Calvert:* Are your female teachers in primary schools paid higher than the male teachers ?—The female teachers get more, as the supply is very small.

23636. The female teacher is not a means of economy in this country as is the case in Western countries ?—No, she is not.

23637. It is not like in America and England, where she is a cheaper product ?—No; the supply is so very small here.

23638. *Rai Bahadur Bannerji:* Supposing we have the money and we introduce the Punjab system of giving agricultural education in our schools, you have proposed taking up the middle English schools, not the high English schools or corresponding classes ?—High schools are included, I think it is in the proportion of 1 to 2, two middle schools to one high school.

23639. *Sir Thomas Middleton:* What method of aiding local authorities do you contemplate ? Are you going to approve of the scheme of a particular local authority and to promise to pay a percentage to the local authority, or are you going to say to the local authority "We approve your scheme and we are going to give you a grant of a fixed amount towards the carrying out of that scheme" ?—The money raised in the locality is to go to the locality.

23640. Is there not to be a provincial grant ?—There is to be a District Committee Fund, and the money raised in the district will go to that Fund.

23641. Is there no contribution from the Central Fund ?—The amount contributed will be the amount raised from taxation within the district.

23642. *Mr. Gupta:* There is no contribution from outside ?—The District Committee will have any funds that Government may like to give in addition.

23643. *Sir Thomas Middleton:* That will be to the District Fund as a whole, not for education ?—The Bill contemplates a District Committee Fund into which money from various sources will flow, and the money raised in the district will be paid into that fund. If Government desire to supplement it from provincial funds, that would be paid in to the fund.

23644. What would be the method of paying in from the provincial revenues ? Would it be by way of a percentage of the amount raised in the district, or would it be by way of a block grant ?—I am pretty certain it would be a block grant, just to supplement the activities of the District Committee.

23645. There is a provision for contribution from outside ?—Yes.

23646. Is it contemplated that the provision would be substantial ?—No.

23647. Nothing in the neighbourhood of 50 per cent. ?—No. For many years to come the main Government assistance towards this scheme would be the provision of training facilities for teachers.

23648. What proportion would the existing grant bear to the total revenue at the disposal of the District Board ?—The figure in the Resolution is 30 lakhs and the taxation we contemplate would raise it, I think, to 80 lakhs.

23649. *Professor Gangulee:* With reference to your *guru* training schools, are the students at any time taken to the Government farms and shown round ?—I do not think they are.

23650. It has not been the practice ?—No.

23651. Is any *guru* training school situated near Government farms, such as Rajshah and other places ?—There is one at Rajshahi. I think it is a good suggestion ; but I do not think it has been done.

23652. The idea is that these Government farms in every district could be utilised for the training schools ?—Yes, if they could be utilised. The training school staff do not know enough, and you would have to use the farm demonstrators to give instruction, I think.

(The witness withdrew.)

APPENDIX

Note on Adult Education in Bengal

In the past the department wrote of Adult Schools as "night or continuation schools," the object of the latter being stated by the Government of India in 1902 as follows:— "To enable students to complete their education in branches of study which may have been neglected or not attempted. Such continuation schools might be more or less connected with agriculture in rural districts and with industry and commerce in centres of trade" Sir Alexander Pedler, Director of Public Instruction, Bengal, stated in that year that the number of "continuation" schools was 1,005 and the number of pupils 13,846. He added that the standard of attainment in these schools was such that little more could be attempted than the cultivation of the general intelligence of the pupils though something more might be possible in towns in a vocational direction and that they were not really strictly "continuation" schools at all, but purely night schools doing more elementary work than even the day schools. On that correspondence Government sanctioned Rs. 10 800 for the creation of 200 continuation schools in the Presidency Division in connection with the existing day schools, the monthly stipends to the scholar being Rs. 2 and an additional reward of 2 annas being given for each pupil in regular attendance.

In the Quinquennial Report* of 1918 Mr. Horneli wrote:

Night schools, their pupils and their cost

The following are statistics relating to night schools:—

District	Schools		Pupils		Expenditure	
	1911-12	1916-17	1911-12	1916-17	1911-12	1916-17
					Rs.	Rs.
Burdwan ..	359	351	6,628	6,912	6,201	9,339
Presidency excluding Calcutta.	136	93	3,719	2,258	11,654	7,698
Dacca ..	204	210	3,631	4,847	3,290	5,294
Chittagong ..	9	30	184	761	294	1,159
Rajshahi ..	46	188	905	3,304	759	7,020
Calcutta ..	15	14	449	481	3,314	6,528
Total ..	769	886	15,516	18,563	25,512	37,038

Continuation schools

"*Difference between the ordinary night school and the continuation school*—There is some confusion as to the difference between the night school and the continuation school. The former is an ordinary primary school held after the ordinary school hours to suit the convenience of those who cannot attend day primary schools. Continuation schools are quite different. They are mainly intended for those pupils who have already left school. These schools are not necessarily held after school hours; they may be held in the early morning. There are two classes of these institutions, group I and group II. Group I schools are practically lower primary schools, teaching the three R's in their spare hours to boys who are working, group II schools attempt to impart some rudimentary professional or technical instruction.

"*The continuation school scheme of the Presidency Division*—A scheme for "continuation schools" has been working as an experimental measure in the Presidency Division from 1902.

"*Number and pupils of continuation schools*—The number of continuation schools in 1916-17 was 107 with 2,739 pupils as against 151 schools with 4,168 pupils in the previous quinquennium. There has thus been a decrease of 44 schools and 1,429 pupils during the quinquennium. The total cost of these schools was reported to be Rs. 14,226 in 1916-17 against Rs. 14,968 in 1911-12. The schools are not very popular." This was Mr. Hornell's description of the position in 1918.

*Fifth Quinquennial Review, 1912-13 to 1916-17.

The present position is as follows: There are two main kinds of adult education now existing in Bengal, though all the pupils attending these schools are not adults.

1. Ordinary night primary school—purely primary schools held after school hours to suit the convenience of those who cannot attend day primary schools—These schools are attended by children as well as adults (day labourers, etc.) who have never been to school before. The school teaches the primary course.

2. Continuation schools—These are also primary schools intended for those who have already left the ordinary primary schools at a too early stage. They continue the work of the primary schools teaching the three R's. Some of these teach English and give religious instruction. They help to prevent relapse into illiteracy. Some vocational instruction is also often given, *e.g.*, tailoring, basket-making, joiner's work, etc., and a few of them (39) are purely vocational.

The figures for night continuation and adult schools for the past twenty-five years are as follows:—

Year.	Number of schools.	Pupils.
1899-1900	1,005	18,846
1911-12	769	15,511
1916-17	886	18,563
1921-22	1,551	34,936
1925-26	1,444	27,745

The total expenditure from Provincial Revenues for these schools in 1925-26 was Rs. 38,903. District Board and Municipalities provided Rs. 25,715 also. Of the special continuation type, there were in the Presidency Division in 1926, 127 attended by 2,761 pupils, carpenters, bricklayers, sweepers, cobblers, cart-drivers, book-binders, etc. They cost Rs. 11,580, the figure being part of the Rs. 38,903. Attendance at these schools and at other adult schools is very irregular, so that their value is minimised. The position appears to be that with adequate funds something more than is now accomplished might be done, but that irregularity of attendance will prove a very great drag on the full utilisation of such facilities as may be provided from additional resources.

Mr. L. BURROWS, B.A., Collector of Faridpur (Bengal)

Replies to the Questionnaire

QUESTION 2 (*x*).—The problem of unemployment among educated middle-class youths is already a serious one in Bengal. As a Magistrate-Collector with a comparatively limited amount of patronage, I find constantly that the number of qualified candidates for appointments in Government service is greatly in excess of the posts available, while the inability of Indian gentlemen of good position to find employment for their sons is positively pathetic. "Back to the land" is one solution of the problem, but it is a solution which both parents and youngmen are averse from, and which they will not adopt voluntarily without substantial inducements. Agricultural education of a suitable type may supply technical knowledge or practical experience, but there must also be scope and opportunity for the application of such knowledge and experience. In the district of Faridpur and in Eastern Bengal generally, there is no waste land nor jungle waiting to be brought under cultivation and it will consequently be difficult for students of agriculture to find land on which to use their special training. Government does, however, own extensive *khas mahals* in which a certain amount of land is available for settlement by allotment every year over and above that which has to be settled on the basis of reformation *in situ* or accretion. My idea is that part of this land should be made available for settlement in small but remunerative quantities with selected boys of the *bhadralog* class, who would be required to cultivate it themselves after training in the nearest district agricultural farm. A start might be made in each district with five boys every year, preferably Matriculates or those who have completed the M. E. School course, though undergraduates and graduates need not necessarily be barred if their intentions are *prima facie* sincere. In order to obtain these five boys, ten would be selected and sent to the Faridpur Agricultural Farm for a year's training in practical agriculture. During this year's training they would also be instructed in agricultural carpentry at the Faridpur Industrial School, in elementary veterinary knowledge by the headquarters' Veterinary Assistant, and in the principles of co-operative credit by the local Inspector of Co-operative Societies. After this year's training, during which the boys would be paid nothing except what they earned for their labour on the farm (estimated at Rs. 12 a month), a theoretical and practical examination would be held under the instructions of the Director of Agriculture and the five best boys would proceed to the next stage, the other five having to rest content with the training they had received for application on their own land or on land to be procured for them by their parents or guardians. The five best boys would each receive provisional settlement of 15 *bigha* plot of *khas mahal* land free of rent for three years, and would also be advanced Rs. 200 by Government under the Land Improvements or Agricultural Loans Act for initial expenses, these advances being made on the personal joint and several security of two persons acceptable to the Collector. The advances, with the usual interest, would be recovered in four annual instalments commencing from the second year after the money was advanced with proviso that, if for any reason, the settlement were terminated by the Collector at any time, the whole amount or such balance as was outstanding would be immediately recovered from the two sureties. The work done on the land would be inspected every half year by the District Agricultural Officer and the Khas Mahal Officer, and the Collector would decide on their reports whether the arrangements should continue. Any attempt to sub-let the land in farm or *barga* or otherwise would involve the immediate cancellation of the provisional settlement. At the end of three years, if satisfactory progress had been made and prospects were promising an ordinary ryotwari settlement would be made on the usual terms obtaining in the Government estate in which the land is situated, no *salami* being charged, however. As the average rent in this district is Re. 1 a *bigha* and the average *salami* about Rs. 3 a *bigha*, the cost to Government for each boy would amount to Rs. $1 \times 15 \times 3$ *plus* Rs. 3×15 or Rs. 90 in all, which seems a small price to pay in order to obtain tenants of a good class and to help in solving one of the most urgent problems of the day.

This scheme was discussed at a district agricultural meeting held at Faridpur on the 26th September 1926, and attended by the Director of Agriculture, the Director of Civil Veterinary Department, and representatives from all over the district. It was cordially approved by all present and I have already been approached by two Indian gentlemen who were under the erroneous impression that the scheme had been accepted and was being put into practical working.

QUESTION 3.—Experimental research in agriculture is of little more than academic interest unless its results are communicated to and adopted by the cultivators. The Agricultural Department in Bengal has a good record in research and can legitimately congratulate itself on the discovery of improved jute seeds and varieties of paddy which yield not only a larger outturn, but also a better quality for which higher prices are obtained. Its record in demonstration and propaganda is not, however, quite so

satisfactory. This has been due partly to causes beyond its control, but partly also to mistakes in policy and method. It is, for instance, no use demonstrating an improved variety on Government farm soil manured with nitrate of soda, irrigated by mechanical power through masonry drains, and protected from pigs and jackals by expensive fencing. The cultivator, if he is at all interested in the results, regards them as a sort of curiosity without practical concern to himself. He is not as conservative as he is often made out to be, but he will not follow expert advice nor try experiments until he has seen a particular crop grown under the conditions he has himself to contend with, or at least under conditions he can aspire to, which are within his means, and within the capacity of his soil, his implements, his bullocks, and his own labour. The department is not now as much in touch with the people as is desirable but it is doubtful if it ever was or could really be in close touch with them. More demonstrators, properly trained and adequately supervised, are certainly necessary, but I think that, after providing such demonstrators, the department should work through and in combination with the Collector and his subordinate officers. Under latter-day conditions, the Collector has ceased to have any direct control over Municipalities and District Boards, and his principal constructive work nowadays in Bengal is in connection with Union Boards. These local bodies promise well on the whole, and could be utilised for demonstration and propaganda purposes. I have little faith in co-operative societies, agricultural associations and the like for such purposes because they are dissociated from immediate executive control and are unlikely therefore to produce fruitful results out of Union Boards.

The first essential is a detailed agricultural survey of each district showing what staple crops are grown in each part of it and which areas are suitable for particular departmental seeds and improved varieties. There are no such maps at present so far as I am aware, and seed distribution, etc., seems to be done in a somewhat haphazard way in consequence. After completing this survey, each district should be treated as a unit, its requirements studied, its possibilities investigated, and its improvement encouraged along practical lines. The District Agricultural Officer and the trained demonstrators should then evolve a definite general plan in consultation with the Collector, and demonstration should be done in the villages through actual cultivators on advances of seed to be recouped at the time of harvest if the crop is successful. This can be most easily arranged through Union Boards, which could also simultaneously manage seed-stores, and work as agents for the sale of departmental seed. In order that the Union Board members might carry on these subsidiary demonstrations (the main demonstrations being still done by trained departmental demonstrators at suitable centres) under skilled supervision, it would be necessary for all Circle Officers to be given a short agricultural course devised to meet the immediate end in view. My own idea is that the Bengal Junior Civil Service should be divided into two branches, one consisting of Circle Officers to be used mainly in developing the activities and utilities of Union Boards, and the other of officers employed on general duty. All recruits should be trained on both sides, and then selected for or allotted to one branch or the other, as is done with the executive and judicial branches of the Indian Civil Service. As regards propaganda, magic lantern and, better still, cinema lectures are more useful practically than leaflets which few cultivators read and fewer still understand. This propaganda could be carried on by Circle Officers and Union Board members with appliances and materials supplied by the Agriculture Department.

I am definitely of opinion that the practical utility of the Agricultural Department (and in fact of almost all the special departments) depends largely on the degree to which it can persuade the Collector to co-operate with it and further its objects. Much has been said and written about the personal influence and authority of District Officers having disappeared, but my own opinion based on experience is that what the Collector says still goes, not perhaps to the same extent as it once did, but also to a sufficient extent to enable him to be the greatest single factor for public good. For this reason also much more should be done on the Government *khas mahals* to improve agriculture and act as an example to private landlords.

QUESTION 9.—The measure which I wish to suggest would cover also the drainage of water-logged *bhils*, the re-excavation of silted-up *khals*, the repair of breaches in *khal* banks, and the construction of *bunds* to keep out floods or to hold up water for irrigation and other purposes. Almost every Union Board I inspect in the Faridpur district discloses a local demand for some such small scheme which would be of great material benefit, but which is usually beyond the financial resources of the Union Board without being such as to require expert supervision or large capital expenditure.

There is now in Bengal an Agricultural and Sanitary Improvement Act of 1920 which was apparently intended to facilitate the carrying out of such schemes, but the Act has proved a dead letter practically because its machinery is too intricate and its procedure too cumbrous. The Act and Rules framed under it cannot be understood without special

study, while sound schemes take too long to mature even after the initial financial difficulties have been overcome. The applicants are usually unwilling to give any undertaking to deposit in advance the cost of the survey and preparation of estimates. Thereafter the Collector has to obtain expert opinions from the Departments of Agriculture, Irrigation and Public Health before he can pass an order under section 4. By the time this has been done, and the possibly conflicting opinions of these various departments have been reconciled, every one concerned has lost interest in the scheme and funds are not readily forthcoming for the further stages. After this, an engineer has to be appointed under section 5, objections have to be heard under sections 6 to 8, the scheme has to be carried out under sections 9 to 16, and costs have finally to be apportioned and recovered under sections 17 to 22. All this inevitably discourages the stoutest heart and breaks the most enthusiastic spirit.

The remedy is, in my opinion, (*i*) to do away with any differentiation of schemes as mainly agricultural or mainly sanitary, and (*ii*) to alter the present prescribe pecuniary limit of minor schemes. As regards the first point, it seems evident that the reclamation of a *bhil* or the re-excavation of a *khal* is usually as much a sanitary as an agricultural improvement. Flowing water for irrigation means better water for drinking, while every stagnant marsh means more mosquitoes and more malaria. The distinction is made because the local authorities cannot legally subsidise schemes of agricultural improvement but almost every minor scheme can quite correctly be described as a work of sanitary as well as agricultural improvement. As regards the second point, I would suggest that the pecuniary limit of minor works be reduced to Rs. 5,000 and that the law and procedure be entirely different for major and minor works. All the present restrictions and precautions are probably necessary for major schemes because it is dangerous to interfere on any large scale with the natural processes by diverting the flow of drainage or checking the deposit of silt, or changing the general condition that determine public health. Such schemes must be handled by experts from beginning to end, but are not perhaps the kind of scheme that the Act of 1920 was primarily designed for. Most of the schemes I have seen or been told of are comparatively small affairs and would not cost more than Rs. 5,000 as a rule. These are the schemes that are of real practical importance to the villager who wants either to remove water accumulated in the wrong place both to reclaim the land it covers and to make his environment more healthy, or to collect water in the right place for himself or for his crops or for transporting commodities. Minor works defined as above do not need any elaborate survey or preparation of estimates. The villagers themselves know more about natural drainage lines than the surveyor can discover by means of contours. They can also usually say to within a few hundred rupees what such a scheme will cost. Official help and control will of course be necessary to examine such schemes, to arrange for land where required, and to supervise the actual work, but this could be reduced to the minimum necessary to secure useful schemes executed with economy and efficiency. On the financial side, the requisite funds could be advanced by Government on the joint and several liability of all interested persons as in agricultural loans, or on more material security as in land improvement loans. Alternatively, the financing could be done by Government or District Board advances as loans to Union Boards on the security of their rates. In either event, the cost, including interest on the advances, would be apportioned by the Collector after the work was finished and recovered by certificate procedure if not paid on demand or by reasonable instalments. Only such of the amount as was irrecoverable by these means would be payable by the Union Boards concerned. If such schemes were properly examined in the early stages and carried out expeditiously and efficaciously, there would probably be fewer bad debts than from any other kind of loan or advance. I am convinced that some such simplified procedure would do immense benefit in this district by extending the area available for crops and pasturage, by increasing the normal outturn of agricultural produce, by revivifying decadent tracts and improving the health of the population, and by facilitating navigation and transport generally.

I may add that these ideas were discussed at the district agricultural meeting already referred to and that it was unanimously agreed that "such minor works could be carried out with great advantage all over the district of Faridpur and constitute one of the most urgent local needs." The culturable area would, it was estimated, be increased thereby by at least 10 per cent.

QUESTION 15 (*b*), (*c*) *and* (*d*).—In reply to this question generally, I attach a copy of my "Scheme for *Thana* Veterinary Dispensaries" (*vide* Appendix I).

One point not dealt with therein is the disposal of diseased carcasses. This is a very real danger in a district like Faridpur where there is little or no land to bury the carcasses in, and where the usual procedure is to throw them into the nearest *khal* and trust to vultures and jackals for the rest. The penal provisions regarding public nuisance in Chapter XIV

of the Indian Penal Code have proved insufficient and will remain insufficient until public opinion condemns such practices as dangerous to the community and produces witnesses willing to depose against those who break the law. It is doubtful whether legislation *ad hoc* would give any more satisfactory results. The same applies to the highly dangerous practice of skinning carcasses of cattle in times of epidemic disease. Compulsory notification, segregation and inoculation would not be advisable in my opinion at present. The advantages of inoculation as a preventive measure are being slowly but surely recognised and would soon be universally accepted and even welcomed with a Veterinary Dispensary in every *thana*.

QUESTION 16 (*c*) *and* (*d*).—The months of the year in which fodder shortage is most marked in the Faridpur district are August to October inclusive, the shortage amounting to scarcity in September and the first half of October. In the *bhil* country, the cattle cannot move from the mounds on which the homesteads are built, and there is a shortage of cattle food all over the district because the land is flooded and little or no grazing is possible. Rice is still the staple crop of the district, but the substitution of jute to the extent of about one-fifth of the cropped area has reduced the amount of paddy straw available for cattle. This shortage of fodder seriously affects the condition of the cattle, and the cultivator has sometimes to sell his cattle in November for what they will fetch and buy fresh cattle when the ploughing season comes.

A certain amount of *mashkalai*, *khesari* and peas are grown as fodder crops, while *lata* or *khalia* grass is also grown on new *chars* partly as a cattle food and partly to increase silt deposit. During the rains, the leaves of certain trees (*aswatha* or *pipal* and date), the bark of the plantain tree and water-hyacinth are fed to cattle, but the latter is said to cause diarrhoea. Another source of cattle food is the grass weeded out of the paddy and jute crops before the rains break.

The only means of improving and supplementing the fodder supply in this district is by the larger cultivation of fodder crops during the cold weather. There is no superfluous land in this district for grazing grounds. I think that the Agricultural Department should purchase plots of land in rural areas and demonstrate the growth and use of fodder crops (such as Guinea grass) recommended by the department and suited to the district. This might also be done eventually at the Thana Veterinary Dispensaries I have suggested separately (*vide* Appendix I).

QUESTION 17.—The flood-fertilised soil of the Faridpur district is thrice cropped in some places (with jute and *aman* paddy sown together followed by a *rabi* crop of garlic, oil-seeds or pulses) and twice cropped in 50 per cent. of the remaining area excluding the marshy *bhil* country which only yields one crop. Agricultural work goes on throughout the year. *Boro* paddy is grown in nurseries in December, transplanted in January and cut in March. *Aus* paddy land commences to be ploughed in February, and *aman* paddy land in March. *Aus* is sown in March, weeded in April and harvested in July, while *aman* is sown in April, weeded in May and harvested in November-December. Jute land is ploughed and sown in April, and weeded in June, the cutting, steeping and stripping of the crop lasting from July to September, and its sale from July to November. As regards *rabi* crops, the land is ploughed and sown from October to December and needs little weeding, the crops being harvested from February to April. Every cultivator does not of course work continuously during all these months, and my estimate of the number of days of work done by an average cultivator on his holding during the year is 220 or about seven months.

It is evident therefore that the average cultivator of Faridpur has considerable leisure which he does not, however, use to economic advantage except when pressure of circumstances lowers temporarily his usual standard of comfort. After he has repaired his homestead, gossip, intrigue and litigation occupy his spare time sufficiently as long as he has food to eat and money to spend.

According to the late Mr. J. C. Jack, who made a special study of the economic life of the district, 49½ per cent. of the cultivators live in comfort and are "well-fed, well-housed and well-clothed," while another 46½ per cent. are below comfort but above want. A part even of the most prosperous cultivator's income comes, however, from subsidiary occupations, followed, it may be added, in a more or less desultory fashion and taken in comparatively small doses at a time. Apart from fishing and weaving, service of various kinds is the main subsidiary occupation. In the rains, the cultivator works as a boatman and plies country boats for hire. From about August to December he earns good money in cutting, steeping and stripping jute, and in harvesting paddy particularly in the Backarganj district. There are practically no landless labourers in Faridpur, and this work is done for cultivators by cultivators who may have already engaged others in helping to cut their own crops. From January to March, the cultivator does earth work of various kinds though this work is generally done in Faridpur by imported labour. In April and May, he works under professional boat-builders, masons, etc.

The general question of subsidiary industries is, however, not without practical importance even in Faridpur. The average size of the cultivated holding being about 1½ acres or about 4 *bighas*, many cultivators are compelled, for longer or shorter periods of the slack season, to seek supplementary sources of income and might therefore be taught suitable subsidiary industries. The first necessity is a desire to raise the standard of living, and signs are not wanting that the Faridpur cultivator has aspirations in this direction at least so far as the improvement of his homestead is concerned. The high jute prices of 1925 were followed, for instance, by unprecedentedly large imports of corrugated iron to replace the thatched roofs of houses. Another result was that the prices of fish, milk and sweets went up because the cultivators began to consume their own supplies of milk instead of selling them, and to purchase fish and sweets in the markets.

Industrial organisation is of three kinds: (*i*) the factory industry supplying a large and continuous demand, working with the aid of science, capital and mechanical power, and employing a large labour force; (*ii*) the workshop industry working near the home and under the supervision of a master artisan, and employing a few fellow artisans and apprentices; and (*iii*) the cottage industry carried on at home by one or more members of the family and pursued either professionally as the whole-time business of the family, or still professionally with agriculture as a second line of support, or incidentally as a secondary occupation to agriculture of minor importance in the domestic economy of the household. It is only the third form of industry that concerns an Agricultural Commission, but it is an important living form all over India even in industries where the cottage competes with the factory and the workshop. This is so because handpower in India is cheap and plentiful, and because the possibilities of exchange and division of labour are limited by defective communications and restricted wants. Other reasons that account, and will continue to account, for the survival of cottage industries in India are (*i*) their incidental nature, (*ii*) the easy acquisition of the necessary skill as a part of family life, (*iii*) the accessibility of materials, implements and small but constant markets, and (*iv*) the durability of the products which also wear better while they last.

In spite of these local advantages, cottage industries do not flourish nor progress. They just stagnate without any will to improve or impulse to expand. Such improvement or expansion must be inspired from without and must be based primarily on knowledge of existing conditions and possibilities of development. The official "Summary of the Cottage Industries in the Districts of Bengal" is both incomplete and inaccurate at any rate so far as the Faridpur district is concerned. It contains no figures of castes, families or individuals engaged in each industry, no indication as to whether these castes, families or individuals carry on the industry as a whole-time profession or as an adjunct to agriculture, no information as to the sources of raw materials, methods of working, implements used, markets available, or capital required. A new systematic survey and intensive study of each rural industry is essential, and only then can practical measures be devised to improve conditions in the interests of the people concerned. Certain points in this connection are (*i*) that some cottage industries (such as basket-making) are considered derogatory because they are usually pursued by low caste people, (*ii*) that other such industries (such as sericulture in Faridpur) are impracticable in some localities because raw materials are not available, (*iii*) that others again (such as pisciculture and lac culture) are unknown though tanks abound and *barai* or *kool* trees for lac insects are plentiful, (*iv*) that others again (such as dairy farming and poultry rearing) are not likely to be successful except near towns and then only after the quality of the stock has been improved. On the other hand, economic pressure is becoming so great nowadays, particularly among the middle classes, that conventional prejudices are not likely to be persisted in if any industry can be shown to be paying without requiring much initial capital. Leather tanning, for instance, has obvious possibilities in a country where raw hides and skins are plentiful, while its disagreeable associations are said to be disappearing or disregarded.

Handloom weaving is, I think, the most promising of cottage industries especially as a subsidiary occupation for agriculturists. Once set up, the loom can be worked at any time by any member of the family and the cultivator can save money which he would otherwise have to spend on clothes. There is no caste prejudice against weaving and there are, I believe, parts of Bengal where people of all castes do handloom weaving. The cotton can be grown in the homestead, and the *charka*, *natai* and *tant* can be worked in the *bari* and can be made, repaired and replaced on the spot. The policy of sending around peripatetic weaving instructors at the cost of Government and the District Board is therefore sound, but the instructions should not be confined to professional weavers nor to weaving centres. Even professional weavers need better yarn, better preliminary processes in preparing warps, better methods of weaving, better looms and better methods of financing and marketing.

Other local industries with possibilities of development are (1) mats made of date leaves and *pati* grass, (2) rope-making out of jute, (3) fishing nets out of hemp, (4) brass and bell-metal utensils, (5) pottery and tiles, (6) *gur* making, (7) mustard oil pressing in *ghanis* and (8) rice husking in *dhenkis*. All these, except (4) and (5), are incidental cottage industries.

Generally speaking, the governing conditions are (1) that the cultivators will not leave their villages, or if they do, will stay away for as short a time as possible, (*ii*) that industrial factories in rural areas are almost a contradiction in terms and tend to convert rural into urban areas, while attracting mainly landless labourers, (*iii*) that improved methods, implements, etc., must be such as the cultivator can afford, can use and can have made and repaired in the village, (*iv*) that outside inspiration, aid, supervision and control are necessary and (*v*) that knowledge must be acquired before it can usefully be applied or imparted. As an example of a cottage industry started and encouraged without sufficient knowledge, the embroidering (*kantha*) of bed-covers, tea-cloth, etc., may be mentioned. This industry was started a few years ago in Faridpur to help needy widows of the better classes. The materials were supplied and the work became popular, but after a promising start due to the support of influential purchasers, no further markets could be found for the products and the industry languished and is now almost dead.

QUESTION 20.—I have answered this question with reference to paddy and jute which are the principal commercial crops of the district of Faridpur.

Faridpur is a typical water district of Eastern Bengal covered, except in the north, by a network of rivers, *khals* and drainage channels. During the rains, the only means of communication in the interior is by country-boat or steamer, and this is the season when almost all movement of jute takes place. The winter paddy crop is reaped in November and December, and is transported partly by boats along *khals* navigable throughout the year and partly by cart, pack-pony or carrier. Transport by boats is slow, but comparatively cheap. Carts are used in the north of the district, but the roads are all unmetalled and the bridges uncared for and often unsafe. *Halots* or dry beds of small water-courses are generally used by pack-ponies and carriers, but these *halots* are being steadily encroached on by cultivated land. Generally speaking, the district is, except during the rains, seriously handicapped by the absence of convenient means of communication. In recent years, the water-hyacinth pest has increased this disability. In some places, the channels of communication have been choked up entirely, while in others, the movement of agricultural produce by water has been appreciably hampered.

The existing means of communication may be improved by:

(*i*) Extension of railway lines. The E. B. Railway now runs through the north of the district from Pangsa to Goalundo Ghat with a branch line from Rajbari to Faridpur. Extensions (*a*) to Charmuguria and thence into Bakargunj and (*b*) to Jessore, are contemplated. The former extension will open out a large and rich tract of country.

(*ii*) Improvement of roads and particularly of feeder roads from large trade centres to steamer and railway stations. Roads have been badly neglected by the District Board in recent years.

(*iii*) Eradication of the water-hyacinth pest.

(*iv*) Re-excavation of silted-up *khals* and other drainage channels, and reclamation of water-logged *bhils*. These could be effected partly by the Irrigation Department and the Agricultural Department and partly by minor works financed by Government or local bodies and paid for by the local people.

There are local *hâts* or markets all over the district held twice a week usually. The cultivators bring their produce to these *hâts* for sale to *beparis* and *farias*, who are middlemen working sometimes with their own capital and sometimes on a commission basis, the *bepari* being usually considered a somewhat more substantial person than the *faria*. These dealers also visit the villages when the *hâts* are not sitting and purchase direct from the cultivator in his own home. At the larger centres of trade, there are European, Marwari and other merchants or *aratdars* who take over agricultural produce from the *beparis* and *farias*, stock it in godowns, and despatch it either to the jute mills or other Indian consumers or to the exporting firms in Calcutta. In Charmuguria and a few other centres, jute is pressed into *kutcha* bales before despatch in steamer flats. As regards paddy, most of the rice grown in this district is consumed locally and passes direct from the producer to the consumer of the *hâts*. Rice has to be imported into the district to make up the food supply. These imports are handled by the merchants and sold by them both to retail dealers and to non-agricultural consumers.

The first intermediary is the *bepari* or *faria*, working either on a commission or with his own small capital which he can turn over quickly and profitably especially during the jute season. The *faria* is restricted in the matter of rates by the merchant or *aratdar* for whom he works, while the *bepari* enjoys more liberty of action and can of course use

his own discretion entirely where the capital is his own. This middleman has his economic uses and cannot be advantageously eliminated under existing conditions. He visits the cultivator in his own home or at his nearest *hat* and so saves the cultivator the time and expense of carrying his produce to the larger centres. He thus comes between the producer and the next intermediary.

The second intermediary is the European, Marwari or other Indian merchant or *aratdar*. The *aratdar* works on a commission basis for principals in Calcutta or elsewhere. The merchant works with his own or his firm's capital. Indian merchants are capitalists for some crops and commission agents for others. The European merchants are the agents of big Calcutta firms and buy and sell strictly in accordance with instructions from head quarters. They are financed by supply bills or telegraphic transfers through the local treasury or sub-treasury.

It is difficult to give accurate information as to the margin upon which these intermediaries operate as those concerned are naturally unwilling to disclose business secrets The commission rates are said to vary from 6 to 12 per cent. but the profits of those working with their own capital are considerably greater. They have, however, to lock up money while waiting for favourable prices and have also to take considerable risks which often result in correspondingly large losses. This is particularly the case with jute, paddy being a relatively steady business.

As regards financing, barter is unknown. The capitalists use their own or borrowed capital, the latter being obtained from local moneylenders, loan offices or banks. The big firms operate on the usual methods of commercial credit. Commission agents work of course on capital or credit provided by their principals. *Hundis* are not used in this district. The *dadan* system of advancing money against standing crops is not common either. Under this system where it exists at all, the *mahajan* advances anything from 20 to 50 per cent. of the estimated value of the crop which has then to be harvested under his directions and delivered to him for disposal. In default, the advance is recovered in the usual way with a satisfying rate of interest.

Apart from better means of communication, improvement in the existing system of marketing and distribution cannot be expected except by propaganda and instruction through co-operative sale and supply societies. Such societies should eliminate at least one lot of middlemen, protect the cultivator from having to buy seed and sell produce at a disadvantage, and so increase producing profits all round. I am of opinion that co-operative societies for the sale of jute should not attempt to compete in the commercial side of the business, but should limit their activities to collecting the crop, storing it, and selling it on advantageous terms and at favourable times to the big commercial firms for export out of India or distribution to mills in India. Jute being a highly speculative business in which price fluctuations are considerable and inexplicable, I think that such societies will almost certainly come to grief in competition with business experts who have many reliable sources of information and who, even when they take risks, do so with their own money.

The Agricultural Department has done much to improve the quality of jute and paddy and to introduce improved varieties suited to local conditions. The links in the chain between the department and the cultivator are, however, incomplete. Better organisation is required in this respect because there is no conservatism among cultivators about adopting good seeds or improved varieties once their practical value has been demonstrated. The department does the experimenting very successfully, but the demonstrations are too restricted in scope to have anything but a very gradual effect. More agricultural demonstrators and more local centres of sale and distribution are required, and more care must be taken to ensure that the ryot is not cheated, as he now often is, by unscrupulous persons who profess to be selling departmental seed. The purity, grading and packing of crops are primarily matters for the purchasers, who can usually get what they want as has been shown in the case of jute. Weather and other conditions vary so much, however, that any approach to uniformity seems impracticable.

So far as the cultivator is concerned, any steps to place at his disposal information as to market conditions, etc., would at present be practically useless owing to his ignorance and lack of interest in anything outside his immediate environment. General primary education must be the first step in this direction, though co-operative sale and supply societies may also teach him much that is valuable. I suggested to Government in October last that the preliminary and final jute forecasts should forecast demand as well as supply, but, though this might do away with the present feeling of unfairness, I doubt whether it would make any other material difference. The jute cultivator is no longer out of touch with market prices nor are the middlemen able to take much advantage of his ignorance as they did in earlier days. This year, the jute cultivators of Faridpur held up their jute for considerable periods because they thought (or more

correctly, were led to think) that the prices offered were not good enough. They had, however, to sell a part of their crops to meet their rents and their living expenses, but they kept back as much as they could with the result that, in some places, the falling of the rivers has made it difficult to get their jute to the market at a remunerative price.

So far as merchants and traders are concerned, they are quite capable of taking care of themselves. If they want more information, they will ask for it, but the mercantile community generally is distrustful of commercial intelligence collected by Government agency. Some merchants would like to see the jute forecasts abolished altogether. But this would probably result in more confusion and speculation than now exists. The forecasts could of course be improved, but not without expenditure incommensurate with the advatnages to Government. When the same agency is employed, and the same method used year after year, the margin of absolute error should be constant and the results should be relatively correct enough. The same disability attaches to all Indian statistics collected rurally, and the best course is to work out an average error and adjust accordingly. This is done by the Director of Public Health for vital statistics and is also done by many jute merchants. The best work that any one could do in this connection would be to convince the jute consumers (and particularly the jute mills in India) that, in the case of a monopoly crop, the interests of the producer and consumer are in the long run identical. Co-operation would bring mutual advantage and stop the present ruinous cycle of high prices followed by large crops followed by low prices followed by small crops followed again by high prices and so on.

QUESTION 25 (*a*).—One of the most urgent measures for improving agricultural conditions in Eastern Bengal is some means of dealing with the water-hyacinth pest which is (and will become more so every year) a real menace to agriculture, communications and health. I have given this problem considerable thought during the last two years and have also discussed it with all sorts and conditions of men. The result is the attached "Proposed scheme for the eradication of Water-hyacinth," which has recently been submitted to Government (*vide* Appendix II). I am strongly of opinion that action is urgently necessary and that the more action is delayed the longer will such action take to have any practical effect and the larger will be the expenditure necessary.

(*b*) and (*c*) Economic surveys in typical villages cannot but increase knowledge of the economic position of the cultivators. The main difficulty is the extraction of the necessary information as such enquiries are often regarded with suspicion and alarm because their aims and motives are beyond the cultivators' understanding and admit of easy misrepresentation. It is important therefore that the confidence of the people should as far as possible be gained first. Where a settlement is proceeding in a district, the Settlement Officers make a very suitable agency. Elsewhere the enquiries should be conducted in consultation with the Collector, who can use his subordinate officers to clear up misunderstandings and counteract misrepresentations.

The attached report of such an economic survey of one village of the Faridpur district may be of interest (*vide* Appendix III). I cannot vouch personally for the figures, but I have visited the village and tested generally the validity of the conclusions. The figures were originally collected by a temporary clerk employed by the District Agricultural Officer, and were then checked on the spot by the officer who wrote the attached notes, and who is a very promising probationary Sub-Deputy Collector.

APPENDIX I

Scheme for Thana Veterinary Dispensaries

The necessity for more veterinary dispensaries in a country like Bengal is self-evident. It was voiced in a resolution carried at the July 1926 session of the Bengal Legislative Council and more significantly so far as the district of Faridpur is concerned, at the first District Conference of Union Board representatives held on the 22nd January 1926 in a resolution which suggested that "for the health and prosperity of the people, there should be at least one Veterinary Hospital in every *thana* at Government expense." This resolution was the direct result of the heavy mortality caused by two bad outbreaks of cattle disease (haemorrhagic septicaemia in one case) in 1925-26, the first of which occurred at a season when cattle were needed for cultivating purposes, and both of which killed off thousands of cattle that might have been saved if information had been forthcoming more promptly, and if there had been more centres of preventive and curative treatment. The "at Government expense" portion of the resolution was of course impracticable, but the expression of public opinion in favour of veterinary dispensaries indicated a marked advance on times when *fakirs'* spells and quack remedies were preferred to skilled treatment, and the mere mention of inoculation was sufficient to raise a riot. The present policy of Government is to establish a veterinary dispensary at every district and sub-divisional headquarters through the agency, mainly at the expense, of the District Boards, Government bearing only one-third of the average charges of salary (including leave allowance and pension contribution) of the Veterinary Assistant in charge of each dispensary. Though dispensaries at district and sub-divisional headquarters are certainly not sufficient, especially in areas liable to epidemics of infectious disease, the District Boards will not, owing to want of interest, and cannot, owing to want of funds, take the initiative in establishing more dispensaries. The alternatives are therefore either to let matters slide or devise some scheme which will gradually provide veterinary dispensaries in every *thana* without throwing any unbearable burden on Government or the District Boards.

The present unsatisfactory state of affairs is due in part to defective information of the initial outbreak of epidemics. The disease has generally established itself and spread over a considerable area before information is received and acted on. By that time local resources are inadequate to handle the situation, serum has to be indented for from Calcutta, and temporary Veterinary Assistants have to be requisitioned from the Civil Veterinary Department. This has been remedied to some extent in Faridpur by the adoption of certain rules on the subject in consultation with the District Board. A copy of these rules is attached,* but they can at most only be a palliative without the means to act quickly and effectively on the information received. The Veterinary Assistant of the sub-division may reach the affected village quite quickly, but cannot do much to check the spread of the epidemic without the pertinent serum, and can then only deal with a comparatively small part of the area for which he is responsible. Applications for veterinary assistance cannot apparently be complied with promptly owing to limitations of staff at headquarters, while the Veterinary Assistants sent are necessarily ignorant of local conditions and without the confidence of the local people. It is clear, therefore, that what is primarily required is more Veterinary Assistants on the spot who will be known to the people, ready to act at once on information received, and have at hand, or be able to obtain speedily, the essential necessities of curative and preventive treatment.

The only way in which Veterinary Assistants can be located in every *thana* with properly equipped dispensaries is through the agency of the Union Boards. Section 32 of the Village Self-Government Act authorises Union Boards to establish, repair, maintain and manage such dispensaries, and though each Union Board cannot afford a veterinary dispensary of its own, there is no reason why all the Union Boards in a *thana* should not combine to establish and maintain such a dispensary jointly. Faridpur will have Union Boards all over the district by the beginning of the next *chowkidari* year (*i.e., Baisakh* 1334 or April 1927). The machinery will then be available and the only remaining question is whether the Union Boards will be able and willing to find the necessary money.

There are 25 *thanas* in this district, but four (at the district and sub-divisional headquarters) already have veterinery dispensaries, while there is good ground for hoping that the District Board will before long establish a second dispensary in the Madaripur subdivision. This leaves 20 *thanas* to be provided for, and each *thana* will contain 8 Union

* Not printed.

Boards on an average. The annual cost of running a veterinary dispensary has been estimated at about Rs. 1,800 made up as follows :—

	Rs.
(*i*) Pay (including local allowance, leave allowance and pension contribution) of a Veterinary Assistant at Rs. 62-8 a month—*Vide* rule 3 at page 1 of the Bengal Veterinary Manual	750
(*ii*) Fixed travelling allowance of the Veterinary Assistant at Rs. 25 a month	300
(*iii*) Pay at Rs. 14 and travelling allowance at Rs. 2-8 a month of a peon ..	200
(*iv*) Medicines	350
(*v*) Repairs and replacements	100
(*vi*) Contingencies	100
Total ..	1,800

If, as is understood to be likely, Government assumes financial responsibility for the supply of all sera and vaccines, the District Board of Faridpur can reasonably be expected to contribute, and will probably have no objection to contributing, the amount it spends on such sera to the proposed *thana* dispensaries. In 1925-26, this amount was about Rs. 4,000 which would mean Rs. 200 for each of the 20 *thana* dispensaries. It should be remembered in this connection that Veterinary Assistants in each *thana* will mean also that the District Board will not have to pay out considerable sums for the pay and travelling allowance of temporary Veterinary Assistants and that their four or five headquarters Veterinary Assistants will be able to work more efficiently and effectively in a smaller area. The veterinary dispensary will be located at the *thana* headquarters and the Union Board in which the dispensary is situated will contribute the largest proportionate amount to the required balance of Rs. 1,600, the Union Boards nearest a little less, and those further away still less. This is fair because the people of the nearer Union Boards will undoubtedly derive more benefit from the dispensary than those further away. If one Union Board contributes Rs. 300, three Rs. 250 each and four Rs. 150 each, the total amount obtained would be Rs. 1,650 or a little more than the required minimum. The average Union Board has a population of 10,000 with 2,000 assessed *khanas* of five persons each. To realise the highest contribution of Rs. 300 the additional annual taxation under section 37 (*b*) would be As. 2-5 per *khana*, the average incidence of taxation being now about Rs. 1-5-per *khana*. Several Presidents of Union Board with whom I have discussed this scheme have assured me that their rate-payers would be only too glad to pay this additional taxation in order to secure a *doctorkhana* for cattle nearby, and the additional taxation would of course be correspondingly less in the other Union Boards in the *thana*, *i.e.*, As. 2 per *khana* in three of the Boards, and As. 1-2½ per *khana* in four of the Boards. At a district agricultural meeting held at Faridpur on the 26th September 1926, and attended by the Director of Agriculture, the Director and Assistant Director of the Civil Veterinary Department, and representatives from all over the district, the present scheme was discussed and generally accepted, no financial difficulties being anticipated by the three or four Union Board Presidents who were present. If sera are provided free by Government, and if the district and sub-divisional dispensaries are fitted with under-ground serum chambers by the District Board, the *thana* Veterinary Assistants will be able to deal with epidemics promptly and effectively, and so not only save thousands of cattle, but also save much of the money that has now to be found by the District Board for the pay and travelling allowance of extra temporary establishment. At ordinary times, the *thana* Veterinary Assistants, would treat as outpatients all cattle brought to them by the Union Board rate-payers (and those exempted from Union rates) living in the *thana*, no charge being made except from those whose income exceeds Rs. 50 a month, and the scale of fees for the latter being fixed by the Managing Committee on the lines of Rules 60 and 61 of the Bengal Veterinary Manual. The Veterinary Assistants would be itinerant as well and be required to tour throughout their jurisdictions periodically giving instructions on cattle husbandry generally. After a time, accommodation for in-patients could be provided, a breeding bull could be kept, arrangements could be made for the castration of inferior bulls, growth of fodder crops could be experimented with and their special utility in a water district demonstrated, and subsidiary commercial activities, such as supply and sale of milk and *ghi* could be developed.

Points of detail are that the *thana* Veterinary Assistants will be recruited and controlled in exactly the same way as the present headquarters Veterinary Assistants. Government would not, however, be called on to pay one-third of the establishment charges, but should instead give a lump grant once for all of Rs. 500 to each dispensary for the purchase of instruments and furniture. The dispensaries would be under the general control of the District Board subject to the condition that the annual contribution to be paid by each Union Board within the limits of Rs. 150 and Rs. 300 would be fixed by the

Chairman of the District Board in personal consultation with the District Magistrate, and that any difference between them would be decided by the Commissioner of the Division. The local management of the dispensaries would be in the hands of Managing Committees consisting of one elected representative from each Union Board in the *thana*, the Circle Officer, and one other local gentleman, either official or non-official, nominated by the Chairman of the District Board in consultation with the District Magistrate. This Managing Committee would be responsible for the working of the dispensary on the lines of rule 55 of the Veterinary Manual, for the collection of contributions from the District Board and the Union Boards, and for carrying out the orders of Government or the Director of the Civil Veterinary Department received through the District Magistrate and the District Board. The District Board would also authorise the headquarter Veterinary Assistants to inspect each *thana* dispensary in his sub-division or part of the sub-division once every half year, and these headquarter posts would be filled by selection from among the *thana* Veterinary Assistants.

This scheme can only be introduced gradually as qualified Veterinary Assistants would not be available at once. Further, it should not on any account be forced on the Union Boards, but should be explained to them by the sub-divisional and Circle Officers who, will also have to arrange for land and *kutcha* buildings. In this district, it will, I think be possible to introduce the scheme in five *thanas* quite soon, two in Midnapur, and one in each of the other three sub-divisions. These *thanas* would be selected carefully after preparation by propaganda and with particular reference to the chances of obtaining from a local zamindar or talukdar or other rich man the land and the *kutcha* buildings necessary for the dispensary and Veterinary Assistant's quarters. Five successful dispensaries would be a useful nucleus and would attract others. In the same way as successful Union Boards have led to the establishment of other Union Boards in areas which were at first opposed to the idea.

APPENDIX II

Proposed Scheme for the Eradication of Water-Hyacinth

According to page 15, Vol. XX, No. 2, of the Bengal Legislative Council Proceedings, the District Boards of Backargunj, Faridpur, Dacca, Mymensing, Noakhali, Tippera and Chittagong passed resolutions on this subject in the last quarter of 1925 stating (*i*) that water-hyacinth is a public nuisance and a destructive pest, (*ii*) that the existing bye-laws are not workable nor sufficient, (*iii*) that simultaneous action is necessary throughout all the affected areas, (*iv*) that man-handling is the only method of eradication, and (*v*) that special legislation is required providing for compulsion and for funds in the form of license fees and tolls on boats or an octroi duty on imports and exports.

The Collectors of Eastern Bengal assembled for the final jute forecast conference at Dacca in September 1925 passed a resolution along much the same lines with the important addition that there should be provision for supervision over and co-ordination of, the work in all districts. Finally, in December 1925, the Associated Chambers of Commerce of India and Ceylon resolved that the spread of water-hyacinth in late years has been so pronounced as "to constitute a serious menace to agriculture and communications," and urged on Government "the necessity for legislation enforcing the destruction of the weed."

2. The above are the opinions and recommendations of important public bodies and responsible Government officers. As District Magistrate of Faridpur, I have seen for myself the great inconvenience and delay caused and the very considerable damage done. The Post Office authorities are continually complaining of mails being delayed in rural areas where the usual runner has perforce to be a boatman. One missionary gentleman (Rev. C. E. Prior of the Oxford Mission at Goila in Barisal) wrote that, with impenetrable barriers of water-hyacinth accumulated in tidal *khals*, "traffic against the tide is practically impossible, and with the tide very difficult. Journeys need a double crew and about four times the normal time." The Rukendpur P. S. has been practically cut off from the rest of the district at certain seasons of the year, and I have myself had to turn back twice in attempts to reach that Police Station by launch. The District Board has found it "impossible to cope with *kachuri* even by spending money." The amounts the Board has actually spent have been Rs. 4,252 in 1923-24, Rs. 3,980 in 1924-25, Rs. 7,111 in 1925-26, while Rs. 7,000 has been budgeted in 1926-27. For all the lasting good this money has done, it might have just as usefully been dropped through a man-hole into a sewer. Finally, in an open letter addressed to His Excellency the Viceroy in July 1926, the writer welcomes the appointment of the Royal Agricultural Commission, and then goes on to say :—

"But we most respectfully beg to submit to Your Excellency that, so far as Bengal is concerned, the report and the recommendations of the Commission, however sound, profound and learned, may not be of any practical good to most parts of Bengal unless and until the water-hyacinth problem in that Province has been effectually and completely solved. This problem has hitherto baffled the genius and the resources of the Government and the scientists. It must be said, though it may not be a pleasant truth to many who are too busy with other things than the real interests of the people, that the people of Bengal have not yet been very earnest in their endeavours to devise means for, and to co-operate with the Government, in the solution of this all important but at the same time immensely difficult problem. That the water-hyacinth has been devastating the agriculture of Bengal and rendering the occupation of cultivation a losing concern to the cultivators in Bengal is too well-known to be repeated here."

3. The material damage to agriculture is undeniable. I have seen it myself and can show it to anyone who is yet unconvinced. Besides the ordinary encroachment on cultivated land from the overflowing banks of hundreds of water-channels of various sizes, much land goes out of cultivation in this district in another way. The water-level over the low-lying parts varies from year to year. In a year of heavy early rainfall (such as the present one), such land does not get rid of standing water at all or too late for ploughing and sowing. This uncultivated land is then occupied in force by water-hyacinth during the monsoons, and is seldom or never cleared again. As quoted above, "the serious menace to agriculture" is put first by the Associated Chambers of Commerce. Coming nearer home, the first District Conference of Union Board representatives held at Faridpur on the 22nd January 1926 unanimously carried a resolution to the effect that, "in view of the fact that the water-hyacinth pest is seriously prejudicing communications and agriculture in the low-lying parts of this district, this Conference recommends that Government undertake special legislation for its eradication. Again, at a district agricultural meeting held at Faridpur on the 26th September 1926, and attended by the

Director of Agriculture and representatives from all over the Faridpur district, the following resolution was adopted :—

"That this meeting of representatives from all over the Faridpur district considers that, apart from the great inconvenience to traffic, at least 5 per cent. of the culturable area has been put out of cultivation by water-hyacinth, and that this percentage is increasing and will go on increasing unless something is done to eradicate or at least check the pest; that this meeting accepts the principle of compulsory powers with penalties, of adequate organisation, and of indirect taxation to pay for the manual labour and staff: and that this meeting considers that the district of Faridpur will in general be prepared to work such a scheme if put into practical operation."

This estimate of 5 per cent. is possibly exaggerated, though in my various talks with cultivators and landowners all over the district, I have been given estimates of anything between ¼ anna and 4 annas, and even ½ an anna is over 3 per cent. Let us see what 5 per cent. damage means in terms of money. The normal area under jute in the Faridpur district is 211,700 acres, while that under *aman* paddy is 759,900 acres. The damage done is accordingly 10,585 acres of jute and 37,995 acres of paddy. The average outturn of jute is 3·7 bales or 18½ maunds per acre, while the average outturn of *aman* paddy is 12½ maunds per acre. The loss in maunds is therefore 1,958,822½ maunds of jute and 474,937 maunds of rice. The average harvest price of jute and paddy for the last five years has been Rs. 9-8 and Rs. 6-2 respectively. The total loss consequently amounts to Rs. 18,60,313-12-0 *plus* Rs. 29,08,992-2-0 or well over 47⅝ lakhs of rupees per year. And this is the damage in only one, and that by no means the largest one of the districts affected. Over and above this material damage to agriculture, there is also the loss of time and money in travelling and transporting commodities to and from thousands of villages and hundred of *hats*, the personal delay and discomfort to those who have to travel by boat on business or pleasure and the by no means inconsiderable contamination of drinking water. None of these items can be estimated precisely, but the total in rupees, annas and pies is certainly appreciable. This annual loss of the country's wealth must necessarily increase and go on increasing unless something is done. We may now talk of that "something" in lakhs, but we shall have to talk of it in crores within five or ten years if the pest is not eradicated or at least checked. The time is soon coming (if it has not already come) when water-hyacinth in Bengal will be as serious and difficult a problem as rabbits were in Australia, and when a *laissez faire* policy will no longer be open to a civilised government.

4. All that I have said is of course well-known. Questionnaires have been issued and answered, conferences have been held and reports made, enquiring officers have come and gone, but nothing has yet been actually done, and the water-hyacinth meanwhile continues to reproduce itself rapidly and spread relentlessly over more and more water and land. Government has been considering the whole question earnestly for over a year, and the following outlines of a scheme are submitted in the hope that they may be of some assistance in arriving at practical conclusion regarding the action to be taken. The fact that, with immense resources and every mechanical aid that science can contrive, Australia and the United States of America have only been able to check the expansion, without diminishing the expanse, of water-hyacinth need not discourage us in India where man-power, which is ultimately the only means of eradicating the pest, is comparatively cheap and abundantly available at a certain season of the year. This is the saving factor, but it is no use hoping that this man-power will be available on a voluntary or co-operative basis because the cultivator of Eastern Bengal is too well off and not sufficiently far-seeing. It will have to be organised, it will have to be paid for at reasonable rates, and it will have to be forced where it is either too lazy or too luxurious to work even for payment. The mention of organisation brings up another fundamental point, *i.e.*, that all action must be, not necessarily simultaneous as some of the District Boards suggested but at least co-ordinated and concerted. Isolated action however well-organised by local enthusiasm and financed by local contributions is of no permanent utility. The area is freed of the scourge for a time, but the natural flow of drainage, to say nothing of the monsoon floods from the Ganges and the Brahmaputra, soon brings it back from above. This is defect that has fatally marred the laudable efforts of the Faridpur District Board and of several Union Boards in this district and it must inevitably make any penal action under the bye-laws of the local bodies not only hopelessly inefective but also radically unfair.

5. As I see the problem, three things are essential to any successful attack on the water-hyacinth pest. These are power, organisation and money.

Power.—This must be conferred by legislation. The Bengal Water-Hyacinth Act would extend to the whole Province, but would only come into force in those districts or parts thereof to which it might be applied by notification by the Local Government

in the "Calcutta Gazette." The Act would remain in force for five years from the date of such notification, with power to extend it by similar notification for one year at a time up to a maximum of ten years. This provision is important because, while with proper organisation five years should be sufficient, it is essential that the accompanying taxation should be definitely limited in duration. If the pest cannot be eradicated, or at least controlled within manageable limits, in ten years at the outside, there will be no further justification for an unprofitable impost. The Act would declare water-hyacinth a public nuisance within the meaning of section 268, Indian Penal Code, and make its possession or continued possession by owners or occupiers of land and water punishable under sections 290 and 291. It would be understood, however, and a definite undertaking given to this effect, that these penal provisions would not be enforced except as part of a general plan and as a *pis aller* after every other remedy had failed. The primary object being the destruction of the weed rather than the punishment of offenders, the ordinary penalty (to be enforced by the District Committees to be described later) for non-compliance with a requisition to clear land and water effectually on fair payment would consist of power (*i*) to execute the work of collection and destruction, and (*ii*) to recover the cost of such work from the owner or occupier by certificate procedure as a public demand or (where ownership or occupation is disputed, or where there are many co-sharers) by taking over the land or water in usufruct until the cost had been recovered with interest. This provision would apply equally to Government in the *khas mahals* and large rivers forming part of the public domain and not included in any permanently-settled or other estate, to local bodies such as the District Boards, Municipalities, Local Boards and Union Boards, to Railway and Steamer Companies, and to private persons whether proprietors or tenants. If the District Committees proceeded tactfully and methodically, if the areas to be attacked were prepared by local propaganda, and if the people were made to realise that individual failure to act as required would be detrimental to the community as a whole, the above penalties should not often have to be applied, but must be rigorously applied where necessary. Payment at reasonable rates would be made for all work done on the requisition of the District Committee, and anyone failing to comply with such requisition would not only forfeit his right to payment, but would have to pay for the work as well.

Organisation : Under this head, it would be essential to have a Water-hyacinth Controller to direct the whole campaign, to regulate and co-ordinate the work of the District Committees, and to keep the latter up to the collar so that indifference or inefficiency in one district may not wreck or even prejudice the general plan. I am not in favour of a Water-hyacinth Board as the work is essentially a one-man job. The Controller would have to be most carefully selected of course. He must not only be enthusiastic himself, but must also be capable of arousing enthusiasm in others. The mental and other qualities of a good district officer will suffice, but there must be personality as well. The Controller must be provided with a "A" class launch on which to tour comfortably and safely, and he should also have the power of requisitioning smaller launches from district pools in consultation with the Collector concerned. He must have an office staff of three or four clerks including a stenographer-typist, and two peripatetic inspectors for each district in which the Act is in force. Technical advice and assistance of the Government Departments of Irrigation and Agriculture should be also placed at his disposal.

The actual work in each district would be carried out by a District Committee consisting of the Collector (as *ex officio* Chairman), the chairman and vice-chairman of the District Board (one being usually a Hindu and one a Mahommedan), the chairman of the Municipalities, the Sub-divisional Officers, and two elected representatives of the Union Board Presidents in each sub-division. In the Faridpur district, this would give a Committee of 18 members of whom four should form a quorum. The District Committee would need a small clerical staff and should meet at least once a month on the day before or the day after the District Board meeting. The Sadar Sub-divisional Officer should be the Secretary of the Committee. Each District Committee would work out its own plan of campaign in personal consultation with the Controller, and then proceed to carry out that plan as punctually and punctiliously as possible. In Faridpur, which is more or less cut off from external infection except through the Brahmaputra, Ganges and Gorai rivers, the best plan would perhaps be to attack first the water-logged *bhils* in the north of the district where the water-hyacinth collects and awaits the annual rise of water-level that carries it south all over the district. Such areas would be fenced off and dealt with chemically by the Griffiths Spray or otherwise. This would destroy 80 per cent. of the weed without any risk of injury to human, animal or other plant-life, and the remaining 20 per cent. could be manhandled and disposed of on the spot. I should have thought that the dry season was the best time of the year for this operation, but remember that Mr. Malik told us at Dacca in April 1925 that it "should be done in the rains as the vital principle was greater then and a greater ratio of destruction for expenditure was obtained". Elsewhere than in areas which can be isolated and dealt with as above, the best methods

would be frontal attack during the dry season and flanking movements during the wet season, the latter being taken as extending from the 15th June to the 15th October. Direct attack would consist of uprooting by hand and effectual destruction on the spot by drying and burning, by burying, by mixture with cowdung in pits to form manure, by ploughing into the land, by storage for cattle-food during the rains, or by any other suitable means. This work would be done through the agency of the Union Boards which have suitable powers under section 27 of Bengal Act V of 1919, and would be paid for at reasonable rates to be fixed in consultation with the Union Boards with reference to local conditions. The Union Boards and other local bodies (*i.e.*, the District Board and Municipalities) would pay out of their own funds for similar work on land or water (*e.g.*, burrow pits in roadside lands or tanks) in their possession and under their direct control. This is what they are doing at present in many cases, but the work is wasted for all practical purposes. The flank-turning would consist of keeping the weed systematically on the move with the natural flood drainage from cultivated fields into small channls, from small *khals* into large ones, and from large *khals* into big navigable rivers *en route* to the sea. The Rev. Prior says that "once in the Madhumati river where the salt touches the weed it will die". I have no personal experience of the effect of salt water on water-hyacinth, but the Bay of Bengal would certainly absorb it at least. It should be the special function of the Irrigation Department to be responsible for this forward and southward movement in the big rivers and along steamer routes, the steamer companies being asked to assist in any way that may be feasible. Tidal waters would have to be treated with booms such as have already been used with success in the south of this district, and the same means should be used for stopping the re-infection of large *khals* from the rivers, and small *khals* from large *khals* as has also been done successfully in various places in this district. These suggestions are largely *a priori*, but they would soon be either justified by experience or dropped in favour of any better methods that such experience might evolve.

Money: This is the snag on which most schemes of public improvement are wrecked. It is not difficult to put together a scheme the details of which seem to dovetail beautifully until the dry light of finance shows up the gaping cracks. In this instance money, and much money, is needed for the pay of the Controller and his staff, for the staff and office expenses of the District Committees, and for the actual work to be done in frontal attack and flanking movement. License fees, tools on boats, and octroi duties would not yield nearly enough money and would be comparatively difficult to collect. What is wanted is some form of taxation that will reach all or most of those to be benefited, will be easy to assess and collect, and capable also of ready disbursement through the Controller and the District Committees. Agricultural interests, both zamindari and ryotwari, are primarily concerned and could be reached by a cess on the lines of the road and public works cessess under Bengal Act IX of 1880, paid to all recoverable by the same agency, and credited to the Controller for distribution. In the district of Faridpur, such a cess at the rate of 2 pice would yield at least one lakh of rupees, the 1925-26 current demand for road and public work cesses at one anna per rupee of value having been Rs. 2,29,265. But non-agricultural interests are also concerned, and could be similarly reached by a small graduated addition to the income-tax which is not levied on agricultural incomes. If this were considered impracticable because the Income-tax Act is a Government of India Act the alternative would be to empower the District Committees to assess merchant and other non-agriculturists, and to realise such assessments through the Municipalities, Union Boards and *Chowkidari* Unions. The assessments should be based on the municipal, union or *chowkidari* rates, and should aim at producing half the amount derived from the cess on agricultural interest. Municipalities should be included because, though they may be comparatively cheap to clear of water-hyacinth, their urban population would be directly benefited by the work done in the rural areas. It is difficult to frame any reliable estimate as to the annual amount required for work in this district, but it may for the moment be taken at 1½ lakhs of rupees, of which 1 lakh would be spent on actual work and the other ½ lakh contributed towards the general establishment costs. The rates fixed in the Water-hyacinth Act would be maxima reducible by the Local Government if it was found that more money was being demanded than was required. In addition to the amounts realised as above, Government should give an annual provincial grant of at least two lakhs of rupees for expenditure on chemical destruction (where possible) and on work in the big rivers.

I have discussed the question of taxation generally with many Union Board Presidents, non-official gentlemen, and representatives of the cultivating classes. They have in most cases demurred at first to additional taxation as human nature instinctively does everywhere. A simple argument by analogy has, however, usually caused the withdrawal of this objection, that argument being that, like a Union Board, Government has its budget on a larger scale which covers all ordinary receipts and expenditure, and cannot

undertake any extraordinary expenditure without adding to its receipts by taxation. Any still surviving objection has always disappeared when it has been pointed out that the only alternative will be to " let things rip " and watch the damage increase from year to year. As long as it is made clear that the proposed taxation is not permanent, that it will be rigidly spent *ad hoc* and that such expenditure will return the larger part of the taxation to the people's pockets, no serious objection need be anticipated from the rural areas in my opinion.

If Government is not prepared to introduce penal and compulsory legislation, and to rmpose additional taxation, without some stronger indication of public opinion on the whole subject, I would suggest the very early appointment of a committee of officials and non-officials with rural interests adequately represented. The terms of reference to this committee should assume that water-hyacinth is an evil and a growing evil, a real menace to agriculture, communications and health, and should ask the committee to suggest practical mans for dealing with it after considering such schemes as have already been suggested, and taking such evidence and making such enquiries as it may consider necessary. If such a committee reported in favour of legislation along the same or similar lines to those which I have suggested, there need be no hesitation about placing an official Bill before Legislative Council. Personally, I do not think that there should be any further delay, but I quite understand that conditions nowadays require that a bill of the nature contemplated should be assured of as much non-official support as possible.

APPENDIX III

Notes on an Economic Survey of Talma Village

I. *Situation and communications.*—The village is situated about 11½ miles to the south of the Faridpur town. A *kutcha* District Board road which allows wheeled traffic in the cold season only connects it with the town. Boat communication from the Kumar river, and from Bhanga and Nagarkanda, exists throughout the year.

II. *Population and occupation of the people.*—There are 170 families in the village with 910 persons, of whom 237 are males, 303 females, 215 boys and 155 girls. There are 21 Hindu families numbering 117, and the remainder are Mahommedans.

The village is almost entirely agricultural in occupation as 133 families with 756 people have cultivated land and are engaged primarily in agricultural work. Of these 58 families with 274 people are exclusively dependent upon agriculture.

Besides the 133 agricultural families, there are 16 families (with 57 people), who live by agricultural labour alone, 6 more families (with 46 people) who rely on non-agricultural service, 5 families (with 16 people) of professional fishermen, and 10 others engaged in miscellaneous occupations. Table "A" shows the division of the people by occupation.

III. *Supplementary occupations.*—Forty-one families (with 281 people) supplement their agricultural or service income by trade or business. The most general trade is the selling of jute in small quantities from September to December. These petty traders (most of whom are themselves substantial cultivators) purchase jute from other cultivators and sell it to *mahajans* of Faridpur and Madaripur, the local agents of the latter. There are two stationery shops, five vegetable sellers and four Hindu barbers who also deal in betel-nuts. Four very poor families, of which three include no adult male, make a small profit by borrowing unhusked rice and selling it after husking, two families get substantial support from the *biri* trade, while two others supplement their income by dealing in cheap vests and shirts.

Three families (about the richest ones) derive extra income from the farming of the local *hât* which sits on Mondays and Thursdays, while eleven more get small amounts by subletting lands and by petty talukdaries. There are no blacksmiths, potters or carpenters in the village, these services being performed by men of the neighbouring villages who come to the Talma *hât* twice a week. Fishing is not resorted to as a regular supplementary occupation, while the only two *karikor* families are weavers in name only.

IV. *Area and extent of cultivation.*—The area of the village according to the settlement papers, is 2,150 standard *bighas*, and the area actually found in possession of the villagers was 1,320 local *bighas* of 50 yards square or 2,050 standard *bighas* of 40 yards square excluding that under roads and water.

Of the above 1,320 *bighas* 1,084 are under cultivation, 144 *bighas* are the homesteads of agricultural tenants, and 92 *bighas* of non-agricultural tenants.

Of the 1,084 *bighas* of cultivated land, jute is grown in 387 and paddy in 697. All except 180 *bighas* is twice cropped, the latter being unfit for *rabi* crops because it remains under water till January or February. *Maskalai* is grown on about 700 *bighas* for feeding cattle and the remainder is under pulses, mustard, etc. Practically every cultivator's holding is split up into small plots in different places. This is due here mainly to the fact that there are several separate zamindars or other proprietors owning land in the village and that most cultivators hold land under each of them.

V. *Rents and Taxes.*—The average rent is Rs. 2 per *bigha* for cultivated land and Rs. 3 per *bigha* for homestead land. The total rent of the village is therefore about Rs. 2,900, a figure which corresponds closely with the total rent charges stated by the tenants. Cess represents another Rs. 300, and the incidence of rent including cess works out to Rs. 18½ per family or Rs. 3½ per head, Mr. Jack's figure being 3s. 4½d. per head.

The only local tax is the Union Board rate, which amounts to about Rs. 275 for the whole village. This means about one-third of a rupee per head as against Mr. Jack's figure of 3¼ pence. Local taxation has naturally increased somewhat with the establishment of a Union Board, but its assessment is not yet satisfactory. Most of the families having 40 to 60 *bighas* of land (representing a net income of two to three thousand rupees) pay rates of from Rs. 2 to Rs. 3, while families living in want or just above want pay eight annas to Rs. 1½. If the 8 annas per Rs. 100 of income standard had been even approximately adopted, the Union Board rates would yield about Rs. 1,000 in this village.

VI. *Income—chief and supplementary consumption.—Imports and Exports.*—It has been stated that 133 families (with 756 people) depend chiefly on the produce of their

land, but it may be added that the entire population depends primarily upon agriculture either directly or indirectly.

The articles of common use may now be considered one by one and the economic position of the village in respect of them examined.

(*a*) *Fish*—Except very young children and adults of the respectable class, all the people of the village catch fish occasionally for use in the family. When cultivators go to cut jute, they ordinarily take a fishing spear with them and use it as opportunity offers. Fishing traps and hand-nets are resorted to in the rainy season. Money is spent on fish especially during the *hilsa* season, the average expenditure throughout the year being 12 annas per family per month. The village thus pays about Rs. 1,500 for fish.

(*b*) *Vegetables.*—In almost every homstead country vegetables are grown on a small scale for family use. Cauliflowers, cabbages, potatoes and similar expensive vegetables are seldom seen or used by the villagers. They generally grow brinjals, pumpkins and the like. The purchase of these by the villagers may be roughly estimated at Rs. 10 per *hât* (for 3½ days' consumption), thus giving a total of about Rs. 1,000 a year.

(*c*) *Pulses.*—Pulses are grown on about 200 *bighas* in the cold season. This meets the needs of the villagers, very nearly a further expenditure of Rs. 500 being sufficient to cover all requirements.

(*d*) *Spices, etc.*—Tobacco for family use only is grown irregularly by 6 families. At 5 *chittaks* per head per month, the total consumption of tobacco for 400 people would be about 40 maunds worth about Rs. 800. I have taken 400 people as some of the children and about half the females smoke also. Molasses cost about Rs. 20, mustard, chillis, turmeric, etc., along with salt (an important article of daily use specially with these people), sugar, etc., are also purchased for about Rs.1-12-0 per head per year, thus accounting for another Rs. 1,500 of expenditure.

(*e*) *Cloth and piece-goods.*—These are imported. The only two weaving families of the village manufacture and sell a few napkins occasionally as a secondary occupation. Men of the agricultural class generally use a 28″ wide piece of cloth and a napkin. The older children use the same. Women use cloths of the ordinary width, *i.e.*, 42″ to 44″. Excluding the younger children who remain naked, and allowing 4 cloths per head per year, the average expenditure per head of population may be put at Rs. 2-12-0 per year. This means Rs. 2,500 for cloth and napkins. The cost of cheap vests, etc., used in the cold season by some of the people is about Rs. 100 at least.

(*f*) *Fodder and fuel.*—As regards fodder, *kalai*, and paddy straw supplies the needs of the village and there is also a certain amount of grazing though there is no village grazing ground. No cultivator spends money to feed his cattle. He prefers to see them suffer from scarcity or to sell them for what they will fetch.

As regards fuel, jute sticks and straw supply the needs of the village to a large extent. Shrubs and the dry branches of trees add to this supply. Several people told me that they have to buy fuel in the early part of the rainy season, but the money spent on this account is negligible.

(*g*) *Mustard oil and kerosene.*—At 2½ seers per family per month (a tolerably low average) the total consumption of mustard oil in the village comes to about 125 maunds per year. This and kerosene at 2 seers or 2 quarter bottles per family per month costs the village about Rs. 4,000 a year.

(*h*) There remains the cost of tin, iron, ploughing materials, lanterns, utensils, construction of boats, purchase of cattle, and expenditure on festivals and births, deaths and marriages. Mr. Jack's estimate of Rs. 5 for a birth holds good now, though it was perhaps rather high in 1910. The average cost of a death is about Rs. 100 in families of confortable position and about Rs. 20 in indigent families. The general average would be about Rs. 40 as against Mr. Jack's figure of Rs. 25. The present cost of marriages is considerably more than Mr. Jack's figure of Rs. 42 and the villagers agree that the cost now is seldom less than Rs. 80 even for the indigent. This statement is corroborated by the facts disclosed in the enquiry into the causes of debt which show that about 60 per cent. of the debts are incurred for marriages. The cost of a man's marriage is much more among Mahommedans than girl's, but the average of Rs. 80 is not excessive.

On these items the total expenditure may be estimated at Rs. 3,400 or Rs. 20 per family per year.

(*i*) Expenditure on rent and rates has been shown above to be about Rs. 3,500.

(*j*) *Paddy.*—According to the Government standard, 62½ maunds of rice can be obtained from 100 maunds of paddy. The Famine Commission took 7 maunds of clean rice as the average consumption per head per year. Mr. Jack's estimate is 12 maunds of unhusked

rice per head. Taking an average of 11 maunds per head, the total consumption of unhusked rice in the village is about 10,000 maunds per year. Of this the 700 *bighas* of land gives about 4,900 maunds at 7 maunds per local *bigha* on the average, because about 500 *bighas* grows both *aus* and *aman* paddy. The remaining 5,100 maunds cost the village about Rs. 20,200. This completes the expenditure side of the village budget, the total being Rs. 39,200.

As to income, the first item is sale of jute. The 387 local *bighas* of jute land yields about 2,800 maunds of jute, which at Rs. 9 per maund brings in Rs. 25,200 a year. Trade and non-agricultural service brings in about Rs. 6,500 and Rs. 5,500 respectively, these figures being exclusive of local trade and service. The sale of milk gives about Rs. 800. The total money earned is therefore Rs. 38,000. Against the expenditure of Rs. 39,200 this gives a deficit of Rs. 1,200 a year.

I have omitted the cost of seed and cultivation in calculating the value of agricultural produce. Jute seed is purchased, but the cost is small. Paddy seed is generally kept from the previous crop. As regards labour the 206 working men are able to work the 1,084 *bighas* or 5 *bighas* per man. A few outside labourers come from the Madaripur side in years of good harvests. When the local harvest is bad some of the more enterprising villagers go to Barisal to cut paddy.

I also tried to ascertain the way in which the villagers spend their time when not occupied with cultivation. The people say that they get very little leisure and that, when not occupied with weeding, cutting, steeping, and stripping jute or harvesting paddy from April to December, they spend their time in ploughing. It is certain that they do not employ any leisure they may have in any remunerative occupation, but it is also true that they do not get long periods to themselves. Work is comparatively light in the cold season, but they plough in a leisurely fashion throughout that season and also work on *rabi* crops. Fishing does not take more than an hour or so daily, and weaving is not pursued much as a secondary occupation.

VII. *Indebtedness.*—Of the 170 families, 107 (with 580 people) are in debt to a total amount of Rs. 21,780. Of this Rs. 8,270 has been borrowed from the Co-operative Bank at Talma. This figure has been checked from the bank papers. The remaining Rs. 13,500 represents private debts, which could not of course be checked so reliably. Allowing for exaggeration, the total debt of the village may be taken at Rs. 18,000.

It is noteworthy that, of the total debt, about Rs. 8,800 has been incurred by 29 families living in comfort, Rs. 3,800 by 17 families living below comfort, Rs. 4,600 by 28 families living above want, and Rs. 4,500 by 33 families living in want. The people in comfort run into debt more heavily than their poorer neighbours partly because they have to spend more on ceremonial occasions. Mahommedan cultivators as a class do not save or invest money except in land and must therefore borrow when a marriage or other such event occurs. About 57 per cent of the debt was incurred for marriages (often second or third *nika*), 18 per cent for purchase of cattle or land, and the rest for various other reasons. Not more than 6 or 7 debtors had incurred debt for food by taking small temporary loan of a few rupees now and then when in great want. When such loans accumulated and they were pressed for payment, they borrowed money on bonds to pay their small creditors.

The total debt represents an average of Rs. 214 per family and Rs. 43 per head of the population under debt, and Rs. 135 per family and Rs. 24 per head of the population of the village. Mr. Jack's figure of Rs. 11 per head may thus seem too low, but it should be remembered that interest is usually compounded and that the village is a deficit one. Details of debt have been given in Table "C" annexed.

VIII. *Classification of families.*—Following Mr. Jack's division, families in the village have been classified into four categories, (1) living in comfort, (2) living below comfort, (3) living above want and (4) living in want.

His allowance was Rs. 50 per head of people in comfort and Rs. 20 per head for those in want. The prices of almost all foodstuffs have doubled since Mr. Jack wrote, and the same standard of living requires about double his figures. My enquiries lead me to think, however, that the demarcation between the four classes does not depend so much on a mathematical ratio of expenditure as on a variation in some items, a saving in some and an omission of others. A family in want, for instance, does not reduce its staple food ration of rice much, but omits the curry or the pulses or the fish. Then again, a family that gets paddy from its fields is more confortably off than one which earns comparatively more in money, but has to buy rice. I believe the figures given in Table "D" represent the condition of the people correctly. Of the families, 58 or 34·1 per cent (with 377 or 39·2 per cent people) have been found living in comfort, 21 or 18·2 per cent (with 129 or 14·2 per cent people) below comfort, 42 or 22·9 per cent (with 205 or 24·8 per cent people) above want, and 39 or 24·8 per cent (with 199 or 21·8 per cent people) in want.

TABLE A.

Area, Population and Division of People by Occupation.

1. Total area of the village according to settlement papers. 709 Acres (=2,150 Standard *bighas*)

2. Area now found in possession of the village people. 1,320 *bighas* (=2,050 Standard *bighas*.)

3. People.	Caste.	Families.	People.	Percentage to total population.
—	Hindu	21	117	12·8
	Mahommedan	149	793	87·2

4. Total number of agricultural holdings and land under them.

Caste.	Families.	People.	*Bighas* of homestead land.	*Bighas* of cultivated land.
Hindu	9	45	144	1,084
Mahommedan	124	709	82 per cent of the total land of the village.	

5. Average amount of cultivated land: Per family of agricultural families, 8·15 *bighas*.
Per head of agricultural population, 9 *cattas*.

6. Area under non-agricultural holdings: 92 *bighas*.

Occupation.

7. Dependent wholly on agriculture: Families 58, people 274.

8. Dependent partly on agriculture and partly on trade, service, labour, etc.: Families 75, people 482.

9. Wholly non-agriculturist: Families 37, people 154. (This includes 16 families with 57 people—all Mahommedans—who are dependent upon agricultural labour alone). Of the above, 12 families with 72 people are Hindus and 25 families with 82 people are Mahommedans.

10. Service other than agricultural service: 6 families with 46 people.

11. Agriculture and trade: 20 families with 128 people.

12. Agriculture and agricultural Labour: 20 families with 110 people.

13. Profession: Fishermen, 5 families with 16 people.
Casual weavers—Two families.
Casual silversmith—One family.
Trained physicians—One.
Untrained physicians (quacks)—Two.
Mullas (Mahommedan priests)—One family.

14. People engaged in cottage industries—*Nil.* The only two weaver families weave rarely. Ladies of the few respectable families know needle work.

TABLE B.

(1ST PART)

Crops and other Produce.

No.	Crops and other produce.	Area or Quantity.	Amount of produce.	Market value of produce.
			Mds.	Rs.
1	Jute	387 *bighas*	2,800	5,200
2	*Aus* and *Aman* paddy jointly ..	490 „	3,920	20,000
3	Only *Aman*	207 „	1,030	
4	Pulses, Mustard, etc. ..	200 „	600	2,400
5	*Kalai* (fodder)	700 „	....	....
6	Milk	103 cows.	900	4,600

(2ND PART)

Import, Export and Consumption (in rupees).

No.	Article.	Import.	Export.	Production.	Home Consumption.
1	Jute	*Nil.*	25,200	25,400	200
2	Paddy ..	20,200	*Nil*	19,800	40,000
3	Pulses, etc. ..	500	*Nil*	2,400	2,900
4	Fodder and fuel ..	....	....	....	....
5	Vegetables and fruits	1,000	*Nil*	1,550	2,550
6	Milk	....	800	4,500	3,700
7	Fish	1,500	*Nil*	4,500	6,000
8	Spices, tobacco, etc. ..	2,500	*Nil*	100	2,600
9	Mustard oil, kerosene ..	4,000	*Nil*	*Nil*	4,000
10	Utensils, tin ploughing implements, etc.	3,400	*Nil*	*Nil*	3,400
11	Cloth	2,600	*Nil*	*Nil*	2,600
	Total ..	35,700	26,000	58,250	67,950
	Rent taxes, etc. ..	3,500	....	....	....
12	Earned by service outside the village.. ..	....	5,500	....	....
13	Earned by trade from outsiders	....	6,500	....	....
		39,200	38,000	....	....
	Net deficit ..	1,200 per year.			

TABLE C.

Indebtedness of the People.

		Rs.
1.	Total debt of the village	21,782
	From Bank	8,275
	From private persons	13,507

2. Number of families in debt—

	Families.	People.	Rs.
(1) Of "comfort" class	29	172	8,813
(2) Below comfort	17	89	3,784
(3) Above want	28	160	4,528
(4) In want	33	159	4,657
	107	580	21,782

3. Percentage of families in debt—63.
4. Percentage of people in debt—63·7.
5. Average debt per family in debt—Rs. 203.
6. Average debt per head of population in debt—Rs. 37.
7. Average debt of people of the village—Rs. 24 per head.
8. Average debt per family of the village—Rs. 128.

The bank rate of interest is Rs. 1-9-0 per hundred per month when loans taken are below Rs. 100. In case of multiples of Rs. 100, the rate is 12 per cent per annum.

Interest on private debts varies from 3 pice in the rupee per month to one anna, equivalent to Rs. 56-4-0 and Rs. 75 per month for short-term loans, and Rs. 24 to 48 per hundred per year in big or long-term loans. It varies also according to the solvency of prospective debtors.

Total interest at the average rate of 1½ pice per rupee per month is about Rs. 6,100 which means :—

Annually Rs. 57-0-0 per family of families in debt.
Rs. 10-8-0 per head of population in debt.
Rs. 35-12-0 per family of the village.
Rs. 6-10-0 per head of people of the village.

This expenditure has not been included in Table "B."

TABLE D.

Class of family.	Average income per head.	Number of		Percentage of		Average debt per	
		Families.	People.	Families.	People.	Head.	Family.
						Rs.	Rs.
Comfort ..	120	58	377	34·1	39·2	51	303
Below comfort ..	100	31	129	18·2	14·2	42	222
Above want ..	75	42	205	22·9	24·8	27	162
In want ..	50	39	199	24·8	21·8	29	141

Oral Evidence

23653. *The Chairman :* Mr. Burrows, you are Collector of Faridpur ?—Yes.

23654. You have provided the Commission with an interesting note of the evidence which you wish to give and we are greatly obliged to you for your note. Do you want to say anything in addition to what you have stated in your note ?—No.

23655. Your note is very full on the points that you deal with, and I have very few questions to ask you. I want you to tell the Commission what view you have formed of the efficiency or otherwise of the Irrigation Department in this Presidency ?—I have only had anything to do with them since I have been in the Faridpur district where they control the Madaripur bhil route, but do not have any irrigation works as such.

23656. You think there is room for irrigation in the district ?—Yes, certainly. By irrigation I do not mean irrigation literally, but schemes of drainage, re-excavation and the like.

23657. And the control of these deltaic rivers is a very complicated matter, is it not ?—Yes.

23658. It affects communications, because of navigation, it affects health, it affects fertility, both because of the potential water-supply and still more because of the valuable silt which is passing down to the sea ?—Yes.

23659. The policy in the past has been to dam up these rivers and that has had the effect of depositing silt within the river bed, and of raising the bed of the river ?—We have not anything of that sort in Faridpur ; there are no irrigation works at all that I know of.

23660. No damming of the rivers ?—No ; not in Eastern Bengal.

23661. You are on higher land ?—We are not on higher land. There has been no damming of rivers in order to provide water for irrigation or anything of that sort.

23662. *Mr. Gupta :* No embankments ?—No embankments at all.

23663. *The Chairman :* What I wish to get from you is whether you think that the organisation and personnel of the department concerned is sufficiently active and sufficiently large to cope with these problems. Have you formed any view on that point ?—No, not definitely. I certainly think that there is a lot that could be done.

23664. Do you know whether there is any policy ?—Not that I know of.

23665. That does not suggest that the organisation is very active, does it ?—No, it does not.

23666. You have set before the Commission an interesting scheme for dealing with the water-hyacinth pest. Have you formed any view yourself as to the time which it might take if every conceivable measure be adopted to come to grips with the problem ?—I am inclined to think that it could be done in five years if it were properly organised.

23667. You think that water-hyacinth could be eradicated in certain districts in five years ?—Yes ; certainly in ten.

23668. Do you notice any active demand by the public for schemes such as those to deal with water-hyacinth ?—The public of my district make a very strong demand and they are willing to submit themselves to any form of taxation or anything else in order to get rid of the water-hyacinth.

23669. Then on page 472 of your note on demonstration and propaganda you say that you have "little faith in co-operative societies, agricultural associations and the like "?—Yes, for such purposes.

23670. Have you much experience of those organisations performing that particular function ?—No.

23671. You think the Union Boards having the official organisation and the Collector behind them are better equipped ?—Yes ; I think they would be better.

23672. Then on the same page you give it as your view that the Collector's word still carries a great deal of weight and that the Agricultural Department might well remember that in devising their schemes for propaganda ?—Yes.

23673. Do you form the impression that the Agricultural Department has not made as much use of the Collector as they might have made ?—I think they have. At least I know I have been made use of. What I suggest is that the Circle Officers and the Union Boards should also be used.

23674. *Rai Bahadur Bannerji :* You have been made use of by the Agricultural Department ?—Yes.

23675. *Professor Gangulee :* Have the Collectors made use of the Agricultural Department in getting information and so on ?—Yes, certainly.

23676. *The Chairman :* In the section in which you deal with your views about the provision of fodder, you say, ' The only means of improving and supplementing the fodder supply in this district is by the larger cultivation of fodder crops during the cold weather '. Have you considered the possibility of preserving fodder during the season of plenty ?—That could be done if they care to. They have got water-hyacinth and they could cut and keep it.

23677. That apparently does not agree with the cattle very well ?—Since I have written my note, I have made further enquiries and learnt that where it is cut and kept it does not have a bad effect.

23678. That is rather the view of the Agricultural Department who made certain experiments I understand ?—That is also what I have ascertained from the people in my district; if it is dried and kept, it does not have a bad effect.

23679. Are they using it as a cattle food ?—Not to a great extent ; if they cannot get anything else they use it.

23680. Do you think there is any appreciation in the villager's mind of the importance of feeding his cattle properly and adequately ?—I should say not.

23681. Do you think that is a direction in which propaganda might usefully be employed ?—I think he does not recognise that if his cattle were properly looked after he could get more service from them. If anything has got to go, he thinks it is the cattle that should go.

23682. Then I am interested to notice in your answer to Question 17, under Agricultural Industries, that you see signs of a desire for a better standard of living. Do I understand that you see those signs apart from the passing phase of a greater purchasing power, the result of very high jute prices ?—Yes ; it is accentuated by that.

23683. In spite of these various advantages which you detail you say that the cottage industries do not flourish or progress. Can you suggest any reasons other than those which you have given in this note as to why the cottage industries are not taken up ?—No ; nothing other than what I have stated there.

23684. I find it difficult to reconcile what you say here with your statement that there is a desire and a demand for a better standard of living ?—I think that whatever improvement there is in the standard of comfort is simply due to getting more money for their crops.

23685. You think that the stimulus towards raising the standard is not sufficiently strong to drive them to supplement their income ?—Yes.

23686. You form the view that there is a possibility of developing pisciculture on an important scale ?—I should say certainly.

23687. Do you know at all the extent to which pisciculture has been developed in China ?—No. But in Eastern Bengal all the raw material is there ; you cannot build a house without making a tank, pisciculture is mainly done in tanks and not in streams.

23688. In China, I believe the eggs are collected and protected from natural enemies and the fry released not merely in stagnant waters but also in navigable canals and channels ?—I did not know that, but it makes the possibilities of development greater.

23689. You form the view that while co-operative organisations may help it is necessary for the present that Government should give a lead ; is that your view ?—Yes.

23690. You think no other agency is available ?—No, no other agency that will carry the necessary weight and influence.

23691. Then you give a very interesting note on marketing as regards certain kinds of produce. You form the view that if the cultivator were sufficiently literate to be able to read or keep accounts, he would be better equipped to look after his own interests and be advised of the markets ?—Yes, but I think he is becoming more and more self-reliant in that respect already.

23692. Since you have known the country do you think he is now better off ?—Yes, as regards jute in the Faridpur district. I have no experience of other crops.

23693. I would like to have two interpretations from you. What is a *hundi* exactly ?—A *hundi* is a promissory note largely used amongst Hindu merchants. It passes just like a bill of exchange.

23694. Then you say : " The *dadan* system of advancing money against standing crops is not common " ?—Yes ; not in my district.

23695. Is there anything peculiar about the *dadan* system ?—It simply means advance.

23696. Then you go on and talk about the possibility of the development of co-operative sale and supply societies and you say they " should not compete in the commercial side of the business ". You think they can operate without competing to some extent on the commercial side of the business ?—My idea is that they should not deal directly with the mills or do export, but they should do the collection and other work.

23697. You have not included the marketing agencies in the commercial side of the business ?—Not the first middleman, but only the second middleman.

23698. Then you go on and talk about the possibility of disseminating information about jute prices. It does not help the cultivator very much to know what the probable trend of prices is for the crop which he has already either sown or is about to sell, does it ?—No.

23699. What he wants to know is what the next year's demand is likely to be ?—Yes ; he should know what the stocks are when he is sowing.

23700. That is the real point, what are the stocks of jute in the hands of merchants and middlemen at the time ?—Yes.

23701. And that at the moment is not available for the cultivator ?—It is not available from any Government agency.

23702. When was this survey of a village in the Faridpur district made ?—It is within the last couple of months.

23703. And you have looked it through and so far as your experience goes, you believe it to be reasonably accurate ?—Yes. I have been to the village and gone through it with the people there.

23704. Do you attach importance to fragmentation where it exists in your district ?—It exists largely, but I do not think anything could be done to change it.

23705. Does it interfere with the cultivation ?—Yes.

23706. It involves waste of time and energy ?—Yes ; each cultivator as a rule has got about three tenancies under different landlords and situated in different places, and naturally it must take him a longer time to attend to them.

23707. Does the land vary from plot to plot in your district ?—Not from plot to plot.

23708. Could consolidation be effected without doing violence to the interests of any particular individual, if the villagers were agreed that such experiments should be made ?—I should like to see it tried as an experiment. We have got orders now to try it in certain selected Government estates. But the trouble is the diverse proprietory interests. It is not only the cultivator, but also the tenure-holder who would object to having his land changed.

23709. Do you attach value to the collection of statistics about rural economics and rural life over a series of villages ?—Yes, certainly.

23710. You think that a certain amount of money might well be spent in that direction ?—Yes, if it is going to be followed up. There is a tremendous amount of statistical information in the Settlement Reports which is never used.

23711. It is a question of getting it together and interpreting ?—Yes. There is more information in the Settlement Report than probably anywhere else.

23712. *Sir James MacKenna :* One question about the veterinary side. Is there no Act in Bengal which lays down general rules applicable throughout the Province with regard to the reporting of outbreaks of cattle diseases and problems of that sort ?—No ; I do not think so.

23713. All these rules are made under the Village Self-Government Manual by each District Board ?—Yes ; we made them in our district.

23714. One District Board might have these rules and the next might not ?—Yes. There is also a Bengal Veterinary Manual which is for the guidance of the Veterinary Assistants, but I do not think it is much used.

23715. So these rules are made under the Local Self-Government Act ?—They are executive orders. The only part that is obligatory under the Statute is the duty to report. It is purely general ; it simply says, " any information which the District Magistrate may require ".

23716. The water-hyacinth problem is probably as big a question in Burma as it is with you. I take it that you are practically convinced that legislation without a scheme of operation is useless ?—Yes.

23717. You have seen the Burma Bill, I suppose ?—Yes.

23718. What do you think the result of that would be ?—I have not seen it recently, but so far as I recollect it did not provide for the doing of the work.

23719. Then on account of the extraordinary ease with which the plant establishes itself, do you think that the scheme should be taken up on a big provincial or inter-provincial basis ? Do you think it is big enough for Bengal, Assam and Burma to combine ?—I certainly think Assam and Bengal might combine.

23720. Burma ?—It is far away, but it might be useful from a research point of view.

23721. Therefore it would be an extraordinarily big scheme involving a combined engineering problem. Have you considered the engineering method of tackling it ? —No. I think it is possible for Bengal to deal with it even if Assam does not come in. It comes down by the big rivers and if we prevent it from coming into the smaller rivers and *khals* which lead into the district it would be kept in the big rivers and go straight down to the salt water.

23722. I should like to know your methods of dealing with it. Take first *jhils* or lakes; how do you tackle the problem ?—By fencing round and by chemical means.

23723. Have you experience of your own ?—I have no personal experience.

23724. In a concentrated area the chemical process would be easily applicable ?—Yes, where there is no danger of infecting other plant and animal life.

23725. Then how would you tackle the problem in your small creeks ?—During the dry season by man-handling, and during the rains by getting it to move down into the big rivers.

23726. How do you deal with the stuff when it is handled by men ?—Burn it principally.

23727. Then in the larger rivers ?—It would be the job of the Irrigation Department to keep it on the move.

23728. As a district officer you will see that it is one of the most important administrative problems ?—I think it is of the greatest importance. Primary education is more fundamentally important, but this is more immediately important.

23729. *Professor Gangulee :* Do the Local and District Boards show any effective anxiety in eradicating the water-hyacinth pest ?—I have said in my note that the District Board of Faridpur has spent thousands of rupees in the last few years with absolutely no effect at all.

23730. They are anxious to tackle the problem ?—Yes, they have all passed resolutions I do not think you need anticipate any opposition from them at all.

23731. What has happened to the scheme that you have discussed at the District Agricultural Meeting at Faridpur on the 26th September 1926, in regard to the utilisation of land belonging to *khas mahals ?*—I have sent it up to Government and I have not had orders.

23732. It rests with the Government now ?—Yes.

23733. You have consulted the Director of Agriculture in drawing up the scheme ?—He was present at the meeting.

23734. And you think that there is a great deal of scope in that direction in Faridpur ? —Yes.

23735. To what extent is land available for that purpose ?—It is difficult to say because the amount varies from year to year. The land is continually altering as there is a lot of alluvion and diluvion. New land has first to be settled on the legal principles of reformation *in situ* and accretion, and only that remaining over is available for allotment. But I should think that I can get about 1,500 to 2,000 *bighas* a year.

23736. With regard to financing the schemes, would you have a co-operative organisation for settlers ?—I propose that Government should do that because they are Government estates. Government will take no rent for three years and demand no *salami.* It will also make advances for initial expenses.

23737. For how many years ?—Indefinitely. It would pay Government to get a better class of tenant.

23738. Do you think that young men would be attracted to such a scheme as you suggest ?—Yes.

23739. Then with regard to your scheme for *thana* veterinary dispensaries, that also is under consideration I suppose ?—I have sent it up to the Government. The Veterinary Director was present at our September meeting. I have consulted the Union Boards

and am convinced that they will accept the scheme and raise the money. They have already agreed to do so in three *thanas* out of the five in which we wish to start.

23740. One question about your District Agricultural Officers. You do come in contact with your district Agricultural Officers, do you not ?—There is only one in my district.

23741. Wherever he is posted to your district he comes in contact with you ?—The District Agricultural Officer is attached to the farm in my district at headquarters.

23742. Did you ever happen to be present at one of his demonstrations ?—I have not personally seen anything of his demonstration work.

23743. Are you in touch with his work ?—Yes.

23744. What is your view about his efficiency ?—This particular officer who is attached to my district is a first class man.

23745. Do you think that he is an effective agent for propaganda work ?—Yes.

23746. *Mr. Calvert :* In your district are there many tenants, people cultivating purely on rents ?—About five-sixths ; and one-sixth on produce rents. The greater part is cultivated by tenants on rent.

23747. Is there not any scope for an enterprising cultivator to extend his activities by taking more land on rent ?—There is very little land left for settlement.

23748. He could not oust other people by bidding a higher rent ?—No.

23749. Supposing you gave a cultivator better education in agriculture, could there be any scope for him to utilise it by taking more land ?—Not in the Faridpur district except by buying it.

23750. *Mr. Gupta :* He could buy more land ?—Yes.

23751. *Mr. Calvert :* He could not take more land on rent ?—Most of the tenants have got occupancy rights.

The Punjab system is that they can take more land on rent.

23752. *Rai Bahadur Bannerji :* In the Punjab you have more land, but here the case is quite different.

Mr. Gupta : The ryotwari system is in force.

23753. *Mr. Calvert :* Why do you wish to apply this scheme to the *bhadralog* and not to the cultivator class ?—The question I am answering is only with reference to middle-class youths.

23754. Would you give preference to *bhadralog* over rural agriculturists in a scheme like that ?—As part of the problem of unemployment. Whether for good or bad, we have educated these people and find that we have far more men educated than can find employment.

23755. I do not understand why they cannot find work ; there is plenty of work for them ?—Do you mean actual manual labour of any kind ?

23756. Yes ?—That is where you come up against the *bhadralog* tradition against manual labour.

23757. You suggest a detailed agricultural survey in your district. Is not that within the province of the Collector ?—Not that I know of, except for some particular or specific purpose ; as a general survey, it is not.

23758. Are you not supposed to be responsible for the economic development of your district ?—No, not directly.

23759. We in the Punjab are supposed to be in charge practically of everything which is for the good of the district, and as such the agricultural survey would fall on the Collector ?—If it had to be carried out, it would be the Collector who would have to do it, but at present it is not his duty to do so, except as I said as a means to some thing else. If there was any scheme, the Collector would do it.

23760. But a Collector who is keen on the agricultural development of his district would do it, so that there is no need to make any recommendations ?—Government would have to provide the funds. The Collector has not got the establishment to make a survey of that sort.

23761. You have not got sufficient local officials to do the work ?—We have practically no subordinate establishment in Bengal at all.

23762. And you have not got the statistical information readily available for this purpose ?—No.

23763. In the note on a village survey the calculation is made that the interest on the debt is Rs. 6,000 odd a year and the rent is put at Rs. 2,900 ?—Yes.

23764. Then there are cesses or local rates too, about Rs. 300, so that practically there is ample scope for increased taxation if the debt can be reduced ?—Yes.

23765. The people are actually paying Rs. 6,000 which could be made available for other purposes if the debt could be reduced ?—Yes.

23766. Is there in your district any extended use made of the Usurious Loans Act ?—Not so far as I know.

23767. Can you suggest the reason ?—These things are done before the Civil Courts in Bengal and of course as District Magistrate or Collector one has nothing to do with the Civil Court.

23768. Here again is it not a part of the Collector's duty to help the people by bringing the matter to the notice of the Government ?—I do not think it is part of the Collector's duty to tell the judges what to do.

23769. One of the witnesses who appeared before us has said that one of the reasons why this Act is not enforced is that most judicial officers either belong to, or have sympathy with, the money-lending classes ?—I would not like to support that.

23770. In your two notes you say nothing at all about co-operation. Is not co-operation at all a force in your district ?—It is to a small extent. My impression is, I have little direct experience, that in my district there were too many societies started without sufficient enquiries being made, with the result that now about half the time of my certificate officers is spent on realising dues from the members of liquidated co-operative societies.

23771. That I take it has given a distaste for the co-operative idea in the district ?—I would not say that. I agree fully with the principle of co-operation, but it must be done on proper lines. The position must be explained and you must get people to understand what the idea is. I say again my impression is that many of these societies were not started with this knowledge and the money which was obtained was largely wasted with the result that such societies had to be liquidated and the difficulty of realising the money was created.

23772. Have you as Collector met bodies of co-operators for discussion ?—No.

23773. You do not on your tours inspect co-operative societies ?—Yes. All I have inspected is the Central Co-operative Banks of sub-divisions.

23774. You cannot say whether the people have imbibed the ideas of co-operation ?—No.

23775. We have got two quite contradictory bits of evidence. One is that the co-operative movement consists of all that is best in the best possible world and the other is that co-operation is on the decline ?—I should say that the idea is good and can be carried out and should be carried out, but that it should be carried out on lines which would give better practical results.

23776. That is a matter of better or more careful education in starting the society ?—Yes, and better personnel, I think, in the inspecting staff; that is, the people who organise these societies on the spot. That again I say is only my impression.

23777. Would you give us your opinion on the working of the Agriculturists Loans Act ?—It is used practically at present only in times of scarcity and the Collector is limited by the amount which is in his budget for the year. Of course he can apply for more if it is needed and it is always given, but only on the ground that there is scarcity or if any crop fails or anything of that sort takes place.

23778. Are you as Collector encouraged by Government to make fuller use of that Act, or do you experience any difficulty in getting money ?—I have no difficulty in getting money during times of scarcity, but it is not used during ordinary times at all.

23779. Is that just a practice built up, or is it the policy of the Government ?—I could not say.

23780. Do you have much in the way of losses of principal sums lent out ?—Not a great deal. I believe that for the Province as a whole about 10 per cent. has to be remitted. I do not know what the figures are, but the loss in Faridpur in my time has been practically nothing. It all depends on the manner of making the initial enquiries. If you make proper enquiries and see that the people who want loans are not people of straw but of some substance and able to stand the racket, then your money is safe.

23781. One witness objects to the lending of money on security ?—That is not a practical proposition.

23782. What about the Land Improvements Act ? Is that used at all ?—Very little, but it can be used much more.

23783. There are projects which might be put in hand ?—Yes.

23784. Is the lack of use due to any lack of encouragement on your side or to the lack of enterprise on the part of the owner ?—On the part of the people applying, I can get the money if the security is satisfactory and the scheme seems sound. I can quote one instance of lack of enterprise. A company of persons applied for Rs. 10,000 to develop certain land. They only had a lease hold right which was not sufficient security. I offered to accept the personal security of two of their number whom I know to be good for the money, but the thing went no further.

23785. The difficulty comes from the people, does it ?—As far as we are concerned, if we get applications we deal with them. As a matter of fact, it is the duty of the Collector to deal with them. We make enquiries to see that the security is sufficient and then ask Government for the money. I have never known of a case in which the money was refused by Government.

23786. The point I am driving at is this. The Imperial Government has made four large efforts to help the rural population by introducing legislative measures. There are the two Loans Acts, the Co-operative Societies Act and the Usurious Loans Act, and I gather that they are not being made the best use of. One Act is not used ; one is an emergency measure, one is very little used and as for the Co-operative Society you are not very enthusiastic about it ?—I would not say that. As I said before, if it is worked properly, I do think that co-operation is a very sound thing and a very good thing.

23787. What change would you wish to see in order to make the co-operative movement more popular and more efficient ?—My experience is limited, but I should say that it is the proper organisation of societies.

23788. And the education of members ?—Yes.

23789. Do you think that if we had men really skilled in rural economics to teach the people, it would help the movement ?—I think there is much better chance of the movement being helped through the Circle Officers in the way I have suggested. These are the officers who are appointed under the Village Self-Government Act and look after the Union Boards.

23790. Are they drawn from the actual cultivating classes ?—They are members of the Bengal Junior Civil Service.

23791. *Professor Gangulee :* Do you think they are able to do this work in addition to their administrative duties ?—They could do all their duties together in conjunction with the Union Boards.

23792. *Rai Bahadur Bannerji :* For that purpose they will require a co-operative training ?—Certainly.

23793. *Professor Gangulee :* You would train the Circle Officers for this purpose ?—I think there is far more hope for the co-operative movement in that way.

23794. *Rai Bahadur Bannerji :* These Co-operative Inspectors who are generally responsible for the organisation of the societies at the outset are as highly educated men as the Circle Officers ?—Their standard of education is not the same, so far as I am aware, they have not the same service traditions, and there is not the same control over them on the spot as the Collector would have over the Circle Officers.

23795. Are not these Co-operative Inspectors equally under the control of the District Magistrate ?—No.

23796. *Mr. Calvert :* So you have really no practical suggestions to make to improve the working of these four important Acts ?—As far as co-operation is concerned, I have made a practical suggestion, namely, that it should be worked through the Circle Officers and the Collector.

23797. That is the executive staff ?—Yes.

23798. You do not fear the charge of making the movement too official ?—I do not personally.

23799. Would you not interfere with the Usurious Loans Act ?—I do not know sufficient about it, to tell you the truth. The only place in which I have applied it is Darjeeling where I tried civil suits. What the civil courts do in the districts, I do not know,

We are supposed to examine existing conditions and make recommendations. We find that the Government have already passed several important Acts which are not being made as full use of as is perhaps desirable in the interests of the rural population.

23800. *Rai Bahadur Bannerji :* Does the rural population really know of the existence of these Acts ? Most of them do not ?—They certainly do not know much about the Usurious Loans Act. From my limited experience of it in Darjeeling, I should say that it does not have much effect on the current rate of interest. You can only apply it when the man goes to realise his loan by a suit in court. You do not effect transactions at all between individuals, which they settle amongst themselves and where the interest goes on from year to year. The Usurious Loans Act has no effect there at all.

23801. *Mr. Calvert :* It applies when either party goes to the court ?—Only the man who has lent the money will go to the court.

23802. Is mortgage common in your district ?—Yes.

23803. Is that an important factor ?—I should say so. There is a good deal of mortgaging of land, but it is largely temporary.

23804. Does the mortgagor experience any difficulty in securing redemption from the mortgagee ?—Not that I know of.

23805. The mortgagee does not try to avoid redemption ?—Not to any extent so far as I am aware.

23806. *Rai Bahadur Bannerji :* Regarding your scheme of veterinary dispensaries where several Unions group together in order to have one, that does not require the passing of any special Act ?—No. They have the power under the Village Self-Government Act.

23807. So you can give a start to it provided the Unions in question agree at once ? Yes. I have got three *thanas* who have agreed and I am only awaiting the Government approval. The District Board has agreed to give Rs. 200 to each.

23808. Supposing you do not have this grant from the provincial revenues and the District and the Union Boards agree to defray their parts of the expenditure, could you not give it a start ?—I think so.

23809. As matters stand in our Presidency, if you have to wait for Government sanction, then nobody knows how long you will have to wait ?—The only difficulty is that I have got to work through the Government because I can only get the Veterinary Assistants from among qualified men.

23810. If your Union Boards can provide the necessary funds, the Veterinary Director I am sure will be able to give you at least 24 Assistants who are available at the present moment ?—I do not think he has got 24 Assistants, but he has promised me five at once, that is to say, as soon as I want them

23811. In the case of the other scheme regarding water-hyacinth, you want a certain law which empowers the Government to collect a certain cess ?—Yes.

23812. Regarding the consolidation of holdings, if the lands are of equal quality in a certain village you think the difficulty is that the tenure holder, as you said, does not agree?—What I meant is that the consolidation of holdings means the fragmentation of tenures.

23813. Can they not do it with the consent of the zamindar ?—Certainly. My idea was that I do not think you will get him to agree.

23814. The zamindars will always agree if they are paid their *salami*, the commutation fee ?—If you have got one zamindar to deal with, it is quite easy, but the difficulty comes in when you have five or six zamindars to deal with.

23815. In my district I have succeeded in making three zamindars agree to do it. Three co-partners of the same zamindari have agreed to do it and a very large area has been consolidated in that way ?—Your opinion is then certainly worth much more than mine because I am only talking on theoretical grounds.

23816. As far as my information and experience go, all these Co-operative Inspectors in the districts have to work under the guidance and perhaps under the orders of the District Officer ?—Not as far as I know.

Mr. Gupta : No, they do not work under the orders of the District Officer.

23817. *Rai Bahadur Bannerji :* In Birbhum, I have seen the Co-operative Inspectors always guided and ordered by the District Officer to do the co-operative work and I do not see any reason why it should be different in different districts. They are equally educated with the Circle Officers. My impression is that nobody objects to the Circle Officers doing this work but they have got many things to do and unless you appoint

extra Circle Officers for the purpose, the co-operative work will suffer ?—If you keep to the present standard of one Circle Officer for 25 or 30 Unions, he can do all the work. You have got to remember that, as the Union Boards go on developing, the work of the Circle Officer in that connection becomes less and less. In my district, the Union Boards are classified into three classes and the Circle Officer is required to inspect the A class Unions once in a quarter, the B class Unions once in two months, and the C class Unions once every month. As the level of efficiency goes higher, the less need there is for the Circle Officer. That is the general idea.

23818. Leaving aside the Usurious Loans Act, if propaganda work be done to enlighten the common people regarding the existence of other Acts, namely, the Land Improvements Act or the Agricultural Loans Act, will not that improve matters ?—I should say so. In this connection, I may say that the Irrigation Commission of 1903 has already suggested that these Acts should be used much more than they are used at present, that larger grants should be made and that it should be made the part of the District Officer to spend the money. If that were done, there would certainly be a great improvement.

23819. *Sir Thomas Middleton :* With reference to the feeding of cattle in the district, you point out that the cultivator does not seem to recognise the service done by cattle and that it is for that reason that he does not feed them. In all the evidence that we have had it has been pointed out that the cultivator recognises the necessity or feeding his cart and plough bullocks but that he neglects his cows. Is that also your experience in Faridpur ?—I do not think I have said anywhere that the cultivator does not recognise the necesssity of feeding his cattle. What I said was that if he had got any choice, the cattle would go by the board.

23820. My point is this. In letting his cattle go by the board, does he discriminate between his plough cattle and his cows ?—He will naturally take more care of his plough cattle.

23821. You propose to attack the water-hyacinth, in the first place, in the *jhils*, by the Griffiths Spray. You have indicated that the hay made from water-hyacinth is quite a reasonably good food. Would it not pay for collection ?—I do not think so.

23822. While the cattle are starving for want of fodder, a large supply is available ?—That is the only time in which they do use it, when they have got any shortage of fodder.

23823. Why should they not make hay and store the hay ?—I could not tell you for what length of time it could be stored ; I have no practical experience of that at all.

23824. You do not think it would pay for collection ?—I do not think so. That would be only an incidental way of disposing of the water-hyacinth.

23825. We have had evidence before us that it is of value as manure ?—Yes ; but in Eastern Bengal they do not need manure.

23826. There was an economic enquiry conducted in Faridpur district by the late Major Jack. The detailed figures were never published ?—No.

23827. Where are those figures ?—They are in my record room. As far as their completeness is concerned, I can only say that when I tried to get them for the purpose of comparing them with the figures of our Talma survey, I could not get anything as a basis for comparison, because there were figures for only 26 families.

23828. We have evidence that all the figures were handed over to the Collector of Faridpur in 1912 ?—That is right ; they are reputed to be under seal in my record room.

23829. You suggested that for the working of agricultural improvements, there should be agricultural surveys. What type of surveys did you have in mind ?—A survey as to what particular kind of paddy or jute was grown in particular tracts.

23830. You wanted a rough classification of the soils of the tracts ?—Yes.

23831. What time would such a classification be likely to occupy ?—I should not think more than about a couple of months, because the areas are homogeneous.

23832. You have got most of the information already available ?—In a general way.

23833. All that wants doing is to pick out the information and map out the land roughly ?—Yes.

23834. How do you propose to carry out the work ? To whom would you entrust work of that sort ?—To people of the same standing as the Agricultural Department demonstrators, under the District Agricultural Officer.

23835. Is it your suggestion that they should go and examine the village papers, question the villagers as to the extent of the different types of soil in the village, make

a note roughly indicating the character of the soil in each village tract, and then make a small district map ?—Something of that sort; I have not worked it out in detail.

23836. To conduct anything like a soil survey would be a laborious business. I wanted to know what you had in mind ?—Simply a survey showing where particular crops could be grown and what sort of seed could be distributed in particular areas.

23837. And the information is available in an accessible way in the village books; it wants collecting ?—It would be in the village notes and in the crop statement, but these are rather old now.

23838. In the villages of Faridpur, do the soils vary rapidly from place to place ? Would you have four or five different types in an average village ?—Two as a rule; up-land and low-land.

23839. With reference to your scheme for the training of boys, what is the quantity of *khas mahal* land that you have got available in the Faridpur district? Is it an extensive area ?—I have got *khas mahal* land which pays a rent of over Rs. 2 lakhs. 1,500 to 2,000 *bighas* can be settled in a year; on account of the law of reformation *in situ* and accretion, it cannot be increased.

23840. In any case, the land is available for an experiment such as you contemplate ?—Yes.

23841. What sort of quality is the land ? Is it worse than the ordinary cultivated land ?—It is just the same as ordinary cultivated land. Some of it is in permanently settled areas, and some in areas settled temporarily.

23842. Have you worked out the probable return to the boys ?—No, I have not worked it out. I thought providing them with a living was quite enough. I have fixed the amount of land at fifteen *bighas* in consultation with Mr. Finlow, with the idea that that land in itself would be quite sufficient to give each a living.

23843. He would want a small capital for bullocks, etc,?—I have suggested that he should get a loan under the Land Improvements Act or the Agricultural Loans Act for initial expenses, repayable by him in instalments, on two personal sureties.

23844. Was it your suggestion that it should be repaid in full in 4 instalments, or was the loan for a longer period ?—It would be repaid in four instalments, commencing from the second year after the money was advanced.

23845. If it were repaid in four instalments, the charges would be very heavy ?—The period may be longer; there is no objection to that.

23846. You note the difficulty in getting the cultivator to adopt the methods which he sees carried on on Government farms. You say he regards them with curiosity, but without practical concern to himself. That is a view I have very often had before me, but do you not think that the cultivator is shrewd enough to know a good thing if he sees it, even if it is on a Government farm ?—If he sees a crop on a Government farm he sees that it is a very much better crop, but he thinks he cannot grow it himself.

23847. He sees the crop, and this has an effect ?—If it is done under conditions he has himself to contend with, that does have a good effect.

23848. The cultivator is shrewd enough to discount the cost of cultivation in a Government farm ?—Yes, but he would not be inclined to go in for experimenting.

23849. He is not asked to experiment, he is asked to imitate on his own land the growing of the crop that he sees on the demonstration area ?—I think the demonstration has a much better chance of success when it is done in his village.

23850. And when it is done on his own land ?—Yes.

23851. *Dr. Hyder:* What is your definition of the annual value of land ?—It is the rent paid; that is the definition in the Cess Act.

23852. Will you require a great deal of money for the eradication of water-hyacinth ?—Certainly, provided you pay for the work. In my scheme, I provide for payment to the man doing the work.

23853. Suppose you had legal power to conscript every man for five days in the month, would you not be able to eradicate the evil in a few years ?—No.

23854. What is the difficulty ?—The problem is on too big a scale. How will you control your conscripts ?

23855. Supposing the men who live above you along the course of the river clear up their side and you then clear your side and the process is continued all along the course of the rivers and streams, and if all the Collectors concerned took the matter up by conscripting all men right up to the age of 50, do you not think the evil could be eradicated ?—If it was practicable, it might have an appreciable effect, but it would not eradicate it. Even if small bits are left lying about it will grow. You will not be able to eradicate it unless it is very thoroughly done indeed.

23856. My idea is to get rid of it first, and then we could look after the little bits. It seems to me that this problem of the water-hyacinth is there because of the apathy and the want of energy on the part of the people ?—Quite so, but the danger was not realized.

23857. If it is not dealt with in time, it will choke up your water ways and your fields ?—That is quite certain.

23858. With regard to the four Acts passed by the Imperial Legislative Council for the benefit of the cultivators, of what use are they to them ? Take, for instance, the Usurious Loans Act; of what use is it to the poor cultivators if it is not enforced by the courts ? The knowledge on the part of the cultivators would not help them very much if the Act were not worked out for the purpose for which it was devised ?—The Act, as far as I know, must be applied by the courts.

23859. That application rests with the court entirely. If the court simply passes a decree without looking to the merits of the case, then the purpose for which the Act was devised is defeated ?—In those circumstances, it would be.

23860. With regard to this question of "Back to the land", have you served as Collector in many districts of Bengal ?—I have served in Chittagong, Dacca, Faridpur and Darjeeling.

23861. Is there a cry of "Back to the land" in any of these four districts ? Does it not arise mostly in papers edited in big towns ?—I think I have stated that the people concerned, the middle classes themselves, are averse from it.

23862. I was thinking of the agriculturists. Is there any cry of "Back to the land" among the people of Faridpur, Chittagong, or Dacca ?—Are you referring to the *bhadralog?*

23863. Not the *bhadralog*, the cultivators ?—They are already on the land.

23864. Even these *bhadralogs* are only a small percentage of the people, congregated in two or three big cities like Calcutta ?—No, we have got them all over the important districts.

23865. They have got no manner of connection with the land ?—Yes, they are connected with land; most of them have got a certain amount of hereditary land.

23866. Then, if you maintain your educational system which produces these *bhadralogs* how is this cry of "Back to the land" going to help them ? It seems to me that what you have to do is just to choke your educational system, and the thing will solve itself. Do you agree ?—That is a thing which I am not prepared to express an opinion on. My idea is simply to give a suggestion which would deal to some extent with the existing problem of unemployment.

23867. The existing problem of unemployment arises on account of the supply exceeding the demand ?—Yes.

23868. If you maintain your educational system which turns out streams of these educated *bhadrolog* who will take up only one kind of work and no other work, you will have that problem constantly before you ?—Quite so.

23869. Therefore, the proper solution of the problem is the choking of the evil where it arises ?—I would not be prepared to agree to that.

23870. *Mr. Gupta :* In the first section of your supplementary note you say, "I am definitely of opinion that the practical utility of the Agricultural Department (and in fact of almost all the special departments) depends largely on the degree to which it can persuade the Collector to co-operate with it and further its objects." Do you not think that instead of the Agricultural Department trying to persuade each cultivator it would be a great advantage if a comprehensive Resolution of Government directed the attention of District Officers to this important matter of all the Departments which might help to raise the people economically ?—Yes.

23871. It would be a great help ?—Yes.

23872. For instance, although you take such an immense interest in the prosperity of agriculture in your district, you do not seem to be so familiar with the co-operative activities of the district ?—No, I am not.

23873. But you hold, and rightly hold in my opinion, that all these things go hand in hand ?—I agree.

23874. So that you think a comprehensive resolution would be a great help ?—Yes.

23875. You say, "I have little faith in co-operative societies, agricultural associations and the like for such purposes, because they are dissociated from immediate executive control and are unlikely therefore to produce fruitful results out of Union Boards." I think there is a slight confusion of ideas in that statement; they are not intended to produce fruitful results out of Union Boards; there are two separate organisations. Is it your opinion that Union Boards would be better agencies for doing this kind of work, propaganda and demonstration, than co-operative societies ?—That is what I mean, yes.

23876. But of course you fully realise that the essence of these organisations is to try to help the people to do these things themselves as far as possible without executive assistance ?—The Union Boards are the people themselves.

23877. That is what I say, so that the executive control does not come in except to give them a little encouragement at the start ?—Yes; my general idea is not to have separate organisations such as Agricultural Associations when you have your Union Boards.

23878. But they are entirely different in the sense that the Union Boards have different duties; they have first to levy a tax and collect the *chowkidari* cess. Of course, the ultimate aim is to assist the people to help themselves. You would not discourage these associations and proceed with the help of the Union Boards alone, would you ?—My ideal is a Union dealing with all these concerns within its area.

23879. But they would do that by encouraging people to help themselves. You know that there are co-operative unions and primary societies ?—Yes.

23880. If the unions of the co-operative societies were coterminous with the Union Boards, there would be no harm in that, would there ?—No.

23881. It would be desirable that both organisations should exist ?—Yes.

23882. But you think in the present circumstances you can make much more use of the Union Boards ?—Yes.

23883. I suppose you do not want to give the impression that you consider it is no part of the Collector's duty to help the co-operative movement as much as possible ?—No, not at all.

23884. Because an inference of that kind might be drawn from what you have said. You do not wish to create such an impression ?—That is not my intention, no.

23885. You say, "My own idea is that the Bengal Junior Civil Service should be divided into two branches, one consisting of Circle Officers to be used mainly in developing the activities and utilities of Union Boards, and the other of officers employed on general duty. All recruits should be trained on both sides, and then selected for or allotted to one branch or the other." In view of the fact that they are to be used for such duties, would there be any point in making these Circle Officers pass examinations in such subjects as law ?—One has to keep in mind the status they have as members of that service.

23886. If there were not that fixed standard, and you had the same class of men, would there be much point in making them go through these law examinations ?—No.

23887. On the other hand, there would be a great advantage in giving them a training in agriculture, the co-operative movement and so on ?—Yes, exactly.

23888. You are in favour of giving them a full training in those subjects ?—Certainly.

23889. And making him development officer for his Circle generally, so that he would take an interest in all these matters ?—Yes, certainly.

23890. That is an idea which I entirely support. Would you be in favour of having a unified Local Board service or of having all these activities separate from the work of the Sub-divisional Officer so that men who did well as Circle Officers might in future be appointed Secretaries of important District Boards with a view to holding out something for them to look forward to in the kind of work to which they are accustomed and in which they may have given proof of their capacity ?—Personally I should prefer, at any rate in the initial stages, that they should be members of the Bengal Junior Civil Service.

23891. Yes, but after they have joined these Services. You know that the Union Boards are under the District Boards, and you could not have Union Boards separated from the District Boards ?—No.

23892. They must get financial assistance from the District Boards. If there were a service in which these men while they served the Union Boards might also serve the District Boards, later on they might rise to be secretaries of the District Boards, and that would be a good thing, would it not ?—Yes.

23893. Mr. Calvert drew attention to these important Acts which have been devised by Government with a view to helping the agricultural and rural population. The Agricultural Loans Act of 1884 definitely states that its object is to deal with times of scarcity. Is not the great difficulty there that we have to insist on joint security, but there are needy people who find it very difficult to offer joint security ; is not that one of the reasons why we are unable to make as much use of the provisions of that Act as we might if we were not compelled to demand joint security ?—Are you speaking of ordinary times or times of scarcity.

23894. I am speaking of times of scarcity ?—I have experienced no difficulty in getting the joint security.

23895. I have heard that advanced as one of the reasons why that Act cannot be utilised to the extent which may be desired in times of scarcity ; it is said that people prefer to go to the *mahajan* rather than to the Collector owing to their difficulty in finding three or four men who will join together to take the loan ?—That is not my experience, if the preliminary work is properly done.

23896. One of the great difficulties with regard to the Land Improvements Act is that you make the loan repayable generally within five years. Borrowers want a longer time in which to repay the loan, and that is probably one of the reasons why they do not make use of the provisions of the Act to a greater extent ?—I do not think there is any definite period laid down in the Act.

23897. The period laid down in the Act is 25 years, but as a matter of fact do you not as Collector limit it to five years ?—No, I generally try to extend it over the life of the work to be done.

23898. How many years do you permit ?—It varies ; I give different periods for different work.

23899. You say that no use is made of the Usurious Loans Act ; are you speaking from experience ?—I said as far as I know ; I do not know what is done in the Civil Courts.

23900. Then what reason have you for making such a statement ? You do not know what use is made of the Act by the Munsiffs. When the Act was passed provision was made for reports by Collectors, but perhaps you were not a Collector then ?—No. I have never reported specially on the Act.

23901. Then you are not in a position to say how far it is being utilised ?—I think I told Mr. Calvert I did not know.

23902. If the Commission require further information on this point, it may be advisable to send an enquiry to the Government ?—Yes.

23903. And perhaps I can supply them with information on that point. With regard to the Bengal Sanitary and Drainage Act of 1920, this limit of Rs. 5,000 is merely an approximate limit which you have fixed ?—Yes.

23904. As to the Engineers to be employed under these Acts would you be satisfied if the District Engineer were entrusted with the laying out of the scheme and the preparation of the plans ? Is it necessary to go to an expert for these small schemes? —No.

23905. You think the District Engineer would do ?—Yes.

23906. With some training from the Agricultural Department if necessary ?—Yes.

23907. That would be a great advantage, because you would have in each district an officer readily available for the work ?—Yes ; I would prefer to have a man of the overseer type working under the Collector.

23908. But if the District Engineer helped, that would be better ?—Yes, certainly.

23909. As to working under the Collector, would you be opposed to letting the chairman of the District Board have the same and concurrent powers with the Collector ?—I have no objection at all.

23910. It would be a good thing, would it not ?—Yes, certainly.

23911. You remember the last circular of Government drawing the attention of Collectors to the methods of making fuller use of those powers. One method would be

to let the Chairman of the District Board have the same powers of initiative as the Collectors now have; you would have no objection to that?—With District Board funds, no.

23912. *Sir Henry Lawrence:* What is the size and population of your district?—2,400 square miles and about 2,250,000.

23913. How many Circle Officers have you got?—Nine.

23914. *Mr. Calvert:* I should like to get my mind a little clearer as to the scope for the enterprising cultivator in face of the prevalence of occupancy rights. You are familiar, of course, with the talk in England as to providing an agricultural ladder for enterprising men to rise from the status of small cultivator or labourer up to that of a big farmer?—Yes.

23915. Does the prevalence of occupancy rights prevent or deter the enterprising cultivator extending his activities?—That is a question I should not like to answer straight off. I do not know of any such enterprising cultivators.

23916. But we hope to improve the education of the cultivating class?—Yes.

23917. That will be of very little use to them if they cannot then find scope for their enterprise and education?—If they have got the money, they can purchase land with occupancy right.

23918. But that would probably absorb all the capital which they will need for their agricultural operations?—The only alternative is that the landlord should be allowed to let out his land by a kind of auction, which would be very much worse; the occupancy right is the cultivator's stronghold and safeguard against eviction.

23919. That is what some people think?—That is my opinion.

23920. But does it not also serve to deter the development of agriculture by maintaining the inefficient on the land and preventing the efficient from taking over the land?—I should say that is not the effect of the occupancy right as such.

23921. But if through the more vigorous efforts of Government there arose in your district an educated and enterprising body of cultivators seeking to find scope for their new-found energy and enterprise, would not the occupancy rights stand in their way?—Naturally it would stand in their way in getting land, except, of course, by purchase; they could not get land simply by making a higher bid at a higher rent or anything of that sort; I presume that would be the only alternative.

23922. Does that mean that any attempt to improve the education and enterprise of your cultivators would be suffocated because they would come to a stage when they would not be able to find scope for their enterprise and education?—No, I should not say so. The population always goes on increasing and there has got to be some method of employing them; it is much better that they should be taught improved agriculture because there are the people and they must be supported on the land.

23923. But do you rule out the possibility of the less efficient being driven off the land by the more educated and more efficient?—As the law stands at present of course it could not be done.

23924. It cannot be done owing to the occupancy rights?—Partly.

23925. So that really the occupancy rights are a bar to agricultural progress?—No, I should not say that because those rights constitute a great protection to the cultivator.

23926. The question of tenure is outside our purview, but all the elements of occupancy rights are not necessary for the protection of the cultivator; the hereditary principle need not be there?—I suppose that is so, but I have not considered it much, and I should not like to give evidence before this Commission as to the effect of occupancy rights on the improvement of agriculture.

23927. It seems to me if the educated enterprising cultivator cannot find scope for his activities, it is very little use educating him?—That as a proposition is correct, of course.

23928. After all, we are only concerned with the agricultural aspect; if a certain number of men are driven off the land by the more enterprising, that does not come within our terms of reference really?—But if you improve the agriculturist and his methods, surely that is better in itself than letting him remain as he is, even though in a certain proportion of cases his enterprise may not find sufficient scope.

23929. But at the same time, you are wasting time, effort and money in improving his education both technical and general, if he cannot utilise the knowledge which has been instilled into him?—But surely a very large proportion would be able to utilise that knowledge.

23930. Your average holding is about three or four acres, is it not ?—Yes, it is between three and four acres.

23931. If you are really going to educate your cultivating class and give them a better knowledge of agriculture, they would want to cultivate much more than that ?—I have never contemplated giving the agriculturist a technical education in agriculture. I have never thought about that ; I simply say, improve his methods and enable him to get a better return from his land by using manures in districts where they are necessary, better seeds and things of that kind.

23932. But do you think with existing holdings in your district, that more improved methods would go far to relieve the position of economic stress ?—There is no economic stress in my district.

23933. The figures given to us show it ?—You mean because they have such small holdings.

23934. Small holdings and a low standard of living ?—Of course I have no basis of comparison except in the Province itself, and my impression is that the cultivators in the Faridpur district are comparatively well off.

23935. Compared with what, European standards ?—No, with other cultivators in other parts of Bengal.

23936. You do not contemplate any such improvement in their position as would raise them to a European standard ?—No, I never have.

23937. *Mr. Gupta :* Your district is permanently settled ?—Yes.

23938. You would not like to give the zamindar the power to rackrent his tenants doing away with occupancy rights and so enabling the zamindar to give the land to the man who promises to pay the highest rent ; do you think that would be in the interests of your ryots ?—Obviously not.

23939. Then you are opposed to giving the zamindar power of giving out land on an auction basis, for instance ?—Certainly.

23940. Then taking the facts as they are, there are three different ways in which a man can acquire land. Has not each zamindar a lot of land which is not leased out and which he is continually leasing out ? His books continually show fresh lands being taken and fresh leases being given ?—Yes.

23941. There is also the waste land to which you have referred ?—Yes.

23942. And there is land which people can get by paying the price for it ?—Yes.

23943. There are three different ways open to an enterprising ryot who wants to increase the size of his holding in your district ?—Yes. In my district there is practically no waste land.

23944. Is all cultivable land under cultivation ?—Over 90 per cent. of it is, I should think.

23945. Do you mean that all the cultivable land is under cultivation ?—Practically all, yes.

23946. But taking the whole Province, there is a very large proportion of land which is cultivable but is not under cultivation ?—That is so.

23947. As regards the condition of your tenants, of course you do not say they are very well off, but would they considerably improve their position if they could grow more crops on the holdings which they have at present ?—Naturally.

23948. They might double their incomes if they liked ?—Yes.

23949. If they then saved, they might acquire enough money to be able to buy land, so that under present conditions there is nothing to deter us from pursuing these efforts to enable tenants to improve their position by growing more, saving more and combining ?—No.

23950. *Professor Gangulee :* You allowed 15 *bighas* per occupant in your scheme ? —Yes.

23951. What is the basis of that ?—As a matter of fact, I consulted Mr. Finlow and took his figure for that ; that is what he thought would be the minimum to support a man, and give him a fair living.

23952. When you are touring in your district does the Registrar of Co-operative Societies occasionally see you ?—I have not seen the Registrar of Co-operative Societies in my district since I have been there.

23953. With regard to the agricultural survey which you propose to make, cannot you get the information you desire from the Settlement Survey Records ?—Yes, but I should like to have it more readily available in the form of a map. Certainly the information is contained in the Settlement Report, but that is rather old now.

23954. I am referring to Major Jack's Settlement Report ?—Yes.

23955. When you are touring in your district, do you have occasion to hear from the tenantry their agricultural requirements ? Do they come to you and say, "We want better seed, or better manure," and so on ?—No.

23956. You do not hear of such demands ?—No, I do not hear of such demands They certainly want the Agricultural Department jute seed.

(The witness withdrew.)

The Commission then adjourned till noon on Thursday, the 6th January 1927.

Thursday, January 6th, 1927

DACCA

PRESENT :

The MARQUESS of LINLITHGOW, D. L. (*Chairman*).

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S.
Sir THOMAS MIDDLETON, K.B.E., C.B.
Sir JAMES MACKENNA, Kt., C.I.E., I.C.S.
Mr. H. CALVERT, C.I.E., I.C.S.
Professor N. GANGULEE.
Dr. L. K. HYDER.

Mr. J. N. GUPTA, I.C.S.
Rai A. C. BANNERJI Bahadur } (*Co-opted Members*).

Mr. J. A. MADAN, I.C.S.
Mr. F. W. H. SMITH. } (*Joint Secretaries*).

Mr. M. WEST, M.A., I.E.S., Principal, Teachers Training College, Dacca.

MEMORANDUM ON EDUCATION AFFECTING AGRICULTURE.

THE TEACHING OF SPECIFIC SUBJECTS (AGRICULTURE, HYGIENE, ETC.) IN PRIMARY SCHOOLS.

1. (*a*) *The smallness of the schools* :—

To teach agriculture, or hygiene or any "specific" subject of that kind, involves a certain amount of apparatus and an intelligent teacher trained in the subject. In countries where the average roll number of the schools is 100, or more, these conditions are attainable; for the cost of the apparatus divided by 100 does not work out at an excessive rate per head; and the school having a number of teachers can arrange to specialize them; this reduces the cost and increases the efficiency of training. Similarly the cost per head of expert supervision is comparatively small owing to the larger size and smaller number of the schools.

The average primary school in Bengal contains only 30-40 boys, and the vast majority of the schools have only one teacher, who is supposed to be instructing four classes simultaneously in all subjects; at the best there are two teachers with a couple of classes each. This is not due to irregular distribution of population in the country side for it will be seen from pages XXV-XXVI of *Survey of Primary Education, 1918** that in towns or large villages which could be served by one, or two, or three large schools, there are five, or ten, or twenty small schools. Thus Bankura Municipality has 12½ schools per square mile. In two mofussil areas taken at random, 10 per cent of the schools were within half a mile of some other school.

The causes are :—

1. A carelessly administered system of small grants-in-aid.
2. The lack of any policy as to the distribution of the grants.
3. Inspecting officers who have not been trained in the problems of primary education, but only as secondary schoolmasters.
4. National psychology.

(*b*) *The depletion of the top classes of primary schools* :—

Teaching of agriculture, or other such subjects would be given in the two top classes But 64 per cent of Class I leaves at the end of the first year; 78 per cent of the first year has been lost by the beginning of the third year. As a result in the two top classes of a primary school of forty boys there are seldom more than ten pupils. Dividing the number of pupils in these classes in 1922-23 by the number of schools, we find that the actual average size of Class III is five pupils and of Class IV only two pupils.

The causes are :—

1. The bottom class of the high English school is Class III: hence boys who are going on to the high schools wait in the primary school only until they are old enough for that class.

* Not printed.

2. Lower class boys are sent to primary school (to get them out of the way) until they are old enough to earn anything. Then they are taken away.

The only real remedy is compulsory education: but there are two palliatives:—

(1) To use central schools, as suggested below, so as to group these small top classes into teachable units. (This would be necessary even with compulsory education.)

(2) To meet the parents' need of the children's labour by instituting 'continuation classes' and part-time classes, for adults as well as children, in the agricultural slack seasons.

(c) *The need of central schools:—*

What seems to be needed is a system of central schools in the larger villages, with four or five teachers and a roll of 120 (or more) boys, in charge of a headmaster of some education and initiative. These would not merely be schools, but centres of communal life, and of continuation classes. The central school would be the village headquarters of the Agricultural, Co-operative Credit and Public Health Departments; would contain the village hall for meetings (and the village wireless set). The older boys from the surrounding hamlets within one mile radius would walk to the central school. Hence the higher classes would be of full strength.

Small children in the infant classes cannot walk to school. Hence there must be feeder schools in the outlying hamlets, containing only the two lowest classes, with two teachers. Or, in very small hamlets, there would be one teacher holding two sessions in the day one for each class. The school radius for such feeder schools might be quarter of a mile.

This involves organisation and compulsion. The problem must be tackled as a whole, systematically. Compulsory education is needed not so much to compel people to send their children to school, but to get some semblance of order into the school system. *No amount of money spent on the present system will produce literacy, and still less will it produce agricultural education.* The money will merely be frittered away in duplicating and quadruplicating existing schools. And money for agricultural instruction would be scattered in grants of annas to incompetent *pundits* in simultaneous charge of four classes.

2. *The provision of teachers for rural schools:—*

A central school would have a staff of four or five teachers. It is always economical to specialise. Consequently such teachers must be trained in an institution with a "selective" course, which will allow specialisation. Such a course is under consideration for the Normal schools. These schools are situated at Divisional headquarters, where the Agricultural, Public Health and other Departments are also represented. Agriculture, hygiene, etc., could be introduced into the course if the department concerned were prepared to teach or to supervise it.

We have also to consider what can be done to give the ordinary teacher in the ordinary primary school some agricultural "bias," and enable him to make some use perhaps of the school garden. Such teachers are trained at *guru* training schools. Gardening forms a part of the curriculum of such schools. Some of these schools are located near a station of the Agricultural Department. It would be easy to re-adjust the marks to give extra weight to gardening. A teacher trained in the normal school, as above, could be put in charge of this work (in addition to other duties); or an officer of the Agricultural Department could run the course himself.

3. *The teaching of nature-study:—*

The Commission may judge for itself how nature study is taught by the *pundit* under present conditions. Please see page 32, 33, and Appendix I-VII of "*Survey of Primary Education*"* for verbatim reports of their lessons.

4. *Is illiteracy due to poverty?—*

Please see "*Survey of Primary Education*,"* page 64 for a study of this actual problem. Net income means nothing; it is actually less in the case of children who attend school than in the case of those who do not. This probably means no more than that the families of the school-going children are smaller. The facts are:—

Family income per month divided by the number of members in the case—

	Rs.	a.	p.	
Where children attend school	3	11	2	monthly.
,, ,, do not attend (Municipal area) ..	3	1	7	,,
,, ,, do not attend (District) ..	2	12	10	,,

The difference above is probably accounted for by the fact that the primary school is the poor man's school; but that some of the better classes send their children there;

* Not printed.

whereas all illiterates are poor. (Please see the graph facing page 64 of the *Survey.*) In fact there is very little difference : there are children just as poor in the school as there are out of it.

The main cause of illiteracy in the children is illiteracy on the part of the parents and failure to realise the importance of literacy—a vicious circle.

5. *The scarcity of vernacular books for village reading :—*

There is no scarcity of Bengali books of poetry, fiction, drama and of general literature ; but there is a great deficiency in books of knowledge. The facts will be found in " *Bilingualism* " (Government of India, Occasional Reports, No. 13)*, in which the whole of this question is discussed at considerable detail. In brief the situation is as follows :—

Arts.	Average Number of Bengali books per annum, 1910-1923.	Sciences.	Average Number of Bengali books per annum, 1910-1923.
Art	31	Physics	0·2
Biography	42	Chemistry	0·3
Drama	58	Astronomy	1·0
Fiction	167	Natural Science ..	7·2
History and Geography ..	88	Agriculture	3·1
Language	361	Sericulture	0·2
Poetry	98	Animal-culture	0·8
Religion	206	Politics	5·0

Average annual output of Bengali books on various subjects, 1910-1923.

There are 48 English and American technical books published for every *one* such Bengali book ; and the Bengali books are almost all of the very popular " cheap-book " variety.

Printing is so cheap in India that the failure must be a failure of demand rather than of supply.

I believe that the causes are :—

1. Neither the primary schools nor the secondary schools at present create reading ability in the vernacular. There are many literates but very few readers. (See the note below on " Relapse into illiteracy "). Hence the demand for vernacular books of knowledge is very small.

2. Nor is there a large army of translators ; for the power of reading English is even more limited. The English reading ability of an M.A. is equivalent to that of an English girl aged 15, of a B.A., to age 14, of a Matriculate to age 10. (See *Occasional Report* * *No. 13*, page 200.)

6. *Relapse into illiteracy :—*

No person who has once learned to read with fluency, understanding and enjoyment could possibly relapse into illiteracy any more than one could forget how to swim. The supposed relapse seems to be due to two causes :—

(*a*) Between 37 and 45 per cent. of the children who go to the primary school leave the school before they have learned to read (see the Table below).

(*b*) The method of teaching reading in the primary school is such that it produces the power of reading aloud words without any understanding of their meaning.

* Not printed.

Children leave school without having learned to read

The Table may be seen on page 29 of " *Survey of Primary Education* *".

Average number of months at school of those who	Months	Number of boys in —th year class	Lost at end of —th year	Per cent of Class I lost to date
Cannot read ..	5	First year (1922)	....	....
Read letters ..	10	....	....	....
Read syllables ..	11-13	769,000	....	....
Read with difficulty..	16-18	Second year (1923).	Lost at end of first year.	64
Read well ..	21-24	277,235	491,845	....
		Third year (1924)	Total lost at end of 2nd year.	
		167,912	601,168	78
Total roll of primary schools in 1922 ..			1,343,714	....
First—Second year loss as per cent. of this ..			....	36·6 per cent.
First—Third year loss as per cent. of this ..			....	44·7 per cent.

Thus, at least 37 per cent of the initial enrolment of the school leaves school with no real power of reading.

The method of teaching reading in the primary school.

The method of teaching consists entirely in reading aloud, with almost no questions on the substance. (Please see ' *Survey of Primary Education* * ', page 30). Moreover, the reading-books used are of such poor quality and so dull that the child is not interested in the substance. Hence the children learn to read aloud with no thought of the substance at all, and are unable to reproduce a single idea. The result is so extraordinary that it would hardly be believed by one who has not seen it. Please see pages 287-8 of *Occasional Report 13** for confirmation. Most children in England probably teach themselves to read, far more than they are taught, their motive being to read some particular story-book. In Bengal there are a certain number of picture-books for infants but extraordinarily little juvenile literature: what there is, is not very good and not at all cheap, mainly cloth-bound books aiming at the School Prize market. There is no ' *Books for the Bairns* '. I have never seen a book of fairy tales in a primary school library. Hence the children never get any practice in reading with understanding and enjoyment, nor any incentive to acquire this power.

The fault lies partly with the teachers. More of it lies with the *guru* training schools and normal schools, whose training in the art of teaching reading is entirely defective. The chief fault lies with the reading books, which are short, dull, and unscientific in construction. But the greatest need of all is of lending libraries for children.

7. *Adult Schools* :—

Adult schools serve two purposes :—(*i*) To teach adults to read, and (*ii*) to continue the education of adults who can read. The former are not uncommon; the latter almost non-existent.

The special features of the adult school are :—

1. That the adults want to learn.
2. They have some power of teaching themselves.
3. Their time and opportunities vary greatly; so that each pupil must progress by himself.

For the last two years we have been experimenting with " Correspondence Courses " on the P. N. E. U. system for zenana women, and I believe that this system would do much for the adult school generally. The system is as follows :—Printed assignments are provided covering about ten days' work. The teacher goes through the assignment with the pupil. The pupil visits the teacher again (or the teacher visits the pupil) when

* Not printed.

he has finished the work, and the teacher gives him a very short test (also provided ready-made). If a pupil has difficulties he can of course see the teacher in between whiles. Some finish an assignment in a week; some take a month over it. They may go as fast as they like, or as slowly; and they may take any subject they like. The crucial point of the system is the assignments. These are drawn up with extreme care and a very high measure of skill. A research student is spending a whole year, whole time, drawing up one such set of assignments in one subject. The reason for this care and trouble is that these assignments must be as far as possible self-teaching; they must be independent of the lack of skill of the teacher. In the case of the assignments for literates, the teacher is merely a post-office. Assignments are sent out complete, with pencils, paste, rubber because our pupils have not got such things, and cannot buy them.

The system was suggested by Lord Lytton. I believe there is a great future for it.

Oral Evidence

23957. *The Chairman,* Mr. West, you are in charge of the Teachers' College at Dacca ?—Yes.

23958. You have provided the Commission with a note of the evidence that you desire to give. Do you want to say anything of a general nature on this subject in addition to what you have written ?—I should like to explain one point about the evidence that I have given, and that is that I do not suggest that any of the proposals which I made should be adopted wholesale at present. I feel that all I have suggested here is a matter for experiment first before it can be broadcasted and that we do not know sufficient of the difficulties which may be met in establishing a system of the kind I have proposed. It would be necessary to go very slowly.

23959. Upon that would you wish to say anything about the order in which you would like the various component parts of this experiment to be undertaken ? Or do you think that that is evident on the face of your proposals ?—Supposing I were asked as to what I proposed to do about this note, I should say that the first thing would be to take one limited area and to set about realising in that area what one imagines to be, or what I have suggested is likely to be, an effective and practicable organisation for primary education. One would certainly make a lot of mistakes at first, and one would probably spend a certain amount of money on things which might have been done more cheaply but eventually one would have in that area a practicable system complete and working in such a way that it would not require expert supervision ; and it then might be possible to say—' Now there you are ; that is what you want. If you want education in your area you can go and do the same. ' There is no tradition, there is nothing to imitate at present in primary education. There is nowhere to begin from.

23960. So that you would go for a small scale experiment of an intensive nature ? Would you take one area and make your experiments ?—One Union. Even then one could not generalise from an East Bengal Union as to what could be done in Birbhum where the country is so completely different. But it would give a pointer and gradually as it was extended the scheme could be modified ; but that would be the starting point.

23961. I see that you advocate a system of what I think you call central primary schools, fed by children who have passed the first and second standards from a feeder school in the neighbourhood ?—Yes.

23962. Have you worked out the financial aspect of the proposal ?—I have worked out in the Survey, of which I have submitted a copy, what the cost of providing education for the whole Province would be. Of course these figures were 1918 figures but I do not believe that this central school system would be more expensive than the larger scheme which I have proposed there. The chief thing about it is that these feeder schools would utilise to a very large extent the existing *pathsalas,* and I cannot think of any other scheme which would not involve the scrapping of the existing *pathsalas.*

23963. And you propose to have one or two teachers in the feeder school ?—That would depend on the size of the hamlet. In a small hamlet one could do with one teacher holding two sessions a day as is done in some mission primary schools. In a large hamlet, however, three teachers would be required. They would always aim at reading and writing and nothing else.

23964. I wonder whether you could give the Commission any ideas as to adult education ? Do you feel yourself that that is a direction in which effort and funds might be immediately invested with advantage ?—Yes. I feel very strongly that it is a line in which something most emphatically ought to be done in the villages, because it is a matter of making the village life more interesting. The *babu* class regard it as a hardship to be sent out into a school in the mofussil, *i.e.,* in a small village place. They say that it is dull ; and it certainly is dull, just the same as it is in England. When the village is dull, people with more brains tend to drift away. But if we could do more in this respect to provide provender for the mind and make the village more interesting there would cease to be so much depletion of intellect from the villages and such a drift of brains from the villages to the towns.

23965. I suppose the apathy as to education which is found amongst a considerable proportion of parents is due largely to the fact that the parents are illiterate themselves. They do not appreciate the value of education ?—I think that must be the main cause because as I have shown in the Survey and in my written evidence, the question of income has obviously very little significance.

23966. Do you feel yourself that adult education is a field in which more experiments are required before a policy can be decided upon ?—I think it would be necessary. It is dangerous to broadcast anything in this country as one broadcasts in England. For

instance, a thing that is successful in England is often a hopeless failure here, and a thing that has proved a failure in England has sometimes done very well here. There are so many unexpected difficulties and a scheme may break down and get a bad reputation through some quite unforeseeable details. In our experiments in the zenanas, for example, one little difficulty which occurred, which we never thought of, was that a zenana would not possess such a thing as a pencil. If we broadcast a scheme straightaway, there may be countless mistakes.

23967. Have you anything that you would like to say about female education?—It is one of the things which has been neglected, comparatively. The more the women are educated, the more they will demand education for their children. I think the women to a certain extent are the offenders in Bengal for withdrawing small children from schools. When I was teaching in a *pathsala* in Dacca town, the mothers used to come and call their children out for jobs in the home. I think they are the offenders in that wastage of children from the lowest classes.

23968. In this matter of the wastage from the lower classes, have you ever considered the possibility of instituting a system by contracting in that parents would undertake to send their children to the school and would receive for them free education provided they left them there for the whole period of the primary education system; but, if the parents decided to take the children away from the school, say, after they entered the second class, then that would be a breach of the contract and a fine would result. If the children remained in the school until Class III, then a smaller fine would result because there again there will be a partial breach of contract?—I had thought of a system of that sort but there is so little enthusiasm for sending the children to the school that I am not certain that it would work; it would merely act as a deterrent. The man may say; my neighbour was fined Rs. 10 because his child left school early, so I shall not send my child at all.

23969. Do you think it is any good sending a child to a primary school and taking him away again at the end of the year?—I think it is not only of no use but may actually result in harm because it distracts the attention of the teacher. The school will be filled up with babies who are not going to stick to the school for any length of time.

23970. And those babies never stop long enough in the school to get any benefit? I mean the ones who leave the school get no permanent benefit either?—They sit there and get a smattering of something which they do not understand.

23971. So that it might be that, although some such scheme as I outlined a moment ago might reduce the total number of children going to school, that reduction would be without advantage if it did not proceed too far. Do you agree with that?—I think it would be necessary to add to such a scheme a provision regarding the age of first admission. This difficulty of the lowest class might be dealt with by some means whereby one could see that children are not to be taken into a primary school below a certain age. Of course, the ages of Bengali children are not known, but one could fix a physical sign. One could say that the child is not to be taken into the school before he appears to be six years old, which is a very easily identified physical age. But it is doubtful whether a rule of that sort could be made unless it were embodied in a Compulsory Primary Education Act. And then, of course, there would be a lot of newspaper criticism of it. The first thing that they started cutting in England, when they started to cut the expenditure, was the kindergarten, which is a luxury.

23972. Would you tell the Commission what teachers pass through your College exactly?—I train mainly teachers for secondary schools. I also have Sub-Inspectors, that is, Inspectors of primary schools. But my present work is mainly connected with the training of secondary teachers. I was an Inspector of Schools before I came here.

23973. I understood from Mr. Oaten yesterday that no primary school teachers pass through the normal colleges. Was I correct in so understanding him? Do you know if primary teachers go through normal schools?—I do not think that was quite correct. There are three grades of training institutions in this country. In the *guru* training schools there are only primary teachers and they are mostly situated in quite small places.

23974. So all primary teachers must come through either those schools or higher schools?—Most of the primary teachers are trained by the *guru* training schools. Then there is another thing called the normal school. A normal school takes teachers who have passed the middle school examination. There are only three normal schools in East Bengal. Quite a good proportion of the men trained in the normal schools go out as vernacular teachers in high and middle schools and a small number of them go as teachers of primary schools. They were originally intended as primary teaching institutions but nowadays things have changed and they mostly supply vernacular

teachers for the lower grades. Then there is the Training College, which is my place. That college trains English-speaking teachers who are graduates.

23975. What type of schoolmaster would you suggest for these central primary schools that you have suggested ?—I think we need the teacher who will be turned out by the revised normal schools. There has just been a Committee on the re-constitution of normal schools, and in general the proposal is that the normal schools should take in matriculates, and that they should have a very selective course. That is to say, a man should have a small number of compulsory subjects and the rest of his subjects he should choose, so that one teacher might be turned out with nature study or agriculture as his special subject, and another man would be rather an art master. These are the men who would be specialist teachers in central schools. But the headmaster of a central school needs to be a man who is specially trained in my college through the L. T. course. A smaller central school might have a better class of man from the normal school as its headmaster. The main supply of assistant teachers for these central schools should come from these reconstituted normal schools. This is what we hope to achieve.

23976. What do you say about the present salaries of primary school teachers ?—The present salaries are so small, or rather the grants are so small, that a man may not be able to live on his grant. I have given the exact figures in the Survey which show that a good half of a primary teacher's income is derived from sources other than the school. There is a list of these other sources of income given in the Survey, *e.g.*, land, a shop, making fireworks, and so on. Now if this other occupation needs his attention, and the school needs his attention,—it is obvious which of them will get it. Personally I think that the aided system is hopeless for primary education. It will not work. The only thing to do is, not to have a State system but, a system run by local education authorities. We should not only dispense with these aided schools, but we should have power whereby one could deliberately dispose of them :—where you get a decent District Board school having its children drawn away by competition from one of these individual private schools, one ought to be able to close the private school or amalgamate it with the District Board school. In one village in West Bengal there are eleven primary schools. Even if you withdraw the grant they do not mind it, because the grant is so small.

23977. *Professor Gangulee :* Do you follow any particular policy in making these grants ?—There has never been, to my knowledge, any pronouncement by the department saying that a grant is not to be given to two primary schools within a certain distance of each other. Some of the Sub-Inspectors do realise the evils of competition and do endeavour to prevent the over-schooling of areas, but they do not like to deprive the poor *pundit* of his living, or something of that sort. A very large number of the Sub-Inspectors have no idea of the subject and do not realise that it is an evil, because the majority of them, as I have pointed out in my written evidence, have been given the ordinary B. T. course which is a course for secondary masters and contains nothing about primary education. It is only since 1920 that I have begun to give a special course for Sub-Inspectors.

23978. *The Chairman :* Do you expect to see many Union Boards taking advantage of the Compulsion Act ?—I do not know sufficient of the administrative side to say how quickly it would move, but I think if they could see some practical example before them such as I have suggested, something that they could do, that was obviously a good thing, they would probably take it up more quickly than they took up Mr. Biss's proposal a few years ago.

23979. Do you expect the adoption of compulsion to affect the social position or pay of the teacher in any way ?—I do not think one could adopt compulsion until one had got a new system of schools and a teacher of a better status than at present.

23980. You cannot conceive of a compulsory and free system of education founded on the present arrangements ?—No.

23981. Have you any constructive suggestions to make as to how this lack of books of knowledge in modern Bengali might be remedied ?—The main thing is that the teaching of reading in the schools should be such as to enable a boy to read for pleasure. At present, the boys in the primary school are taught to read in such a way that in most cases there is a stream of words coming out of their mouths, but not an idea enters their head. I have tried it myself. Give a boy an easy and interesting story, and he will read it aloud and very rapidly and fluently; but ask him the simplest question and he cannot answer it. At present the schools are producing reading power, but not silent reading power; and, to a certain extent, the same thing is true of the high schools and the intermediate colleges. The figures given show that an intermediate college boy has extraordinarily little power of reading. This is all partly due to bad methods of teaching, and it is also due to the absence of libraries. Any library that there may be in a school

is locked up in the headmaster's room. The idea of a village lending library is, comparatively, a new one.

23982. *Professor Gangulee:* You have nothing in the direction of what they have in Baroda ?—I have heard of the Baroda system, but I have not seen it. I tried starting a lending library in a little primary school in this town, and I was immensely impressed by the extraordinary effect it had on some of the boys. There was one boy who took out books of fairy tales. I do not think he had ever read a fairy tale before; he was fascinated by the books; they were a revelation to him.

23983. *The Chairman:* Do you notice any disappointment on the part of the parents or older students on account of the fact that the present system produce a stream of words, but not ideas ? Do you think its weakness is realised by the public at all ?—No; I think that is too technical a point for the public to realise. They hear their little boy read aloud, and they say "How nicely my boy reads."

23984. They do not realise the distinction between expanding the mind and extending conversation ?—No. They do not understand the difference between vocalizing a passage of printed matter and understanding its meaning.

23985. *Sir James MacKenna:* This morning, at the Exhibition, we saw the improved type of school-books which you have been drawing up. Are they being adopted to any great extent in primary schools ?—The English books were only published about a month or two months ago, and they are of course mainly for high schools. It may be some time before they are adopted in primary schools for the teaching of English. They have got to get through the District Boards, and the District Board Text-book Committees have in most cases their own ideas of text-books. The Bengali reading books need a year's more experiment before we are ready to say anything, and if they are not found satisfactory at the end of the year they will have to be completely re-written. There may be a certain number of mistakes,—you have to use a limited vocabulary and see that no 'outside' words get in. The only way of finding out whether they are suitable is by teaching them in a class.

23986. How are the Bengali books produced ? Are they translations or original books ?—There was one Bengali reading book produced under the orders of the Bengal Government by Mr. Majid and Mr. Basu. It is a fairly good book though the style is very difficult in places; it is very patchy. The rest of the existing Bengali books are produced by teachers. They want a little *baksheesh*; printing is so cheap in India and the control of Government over text-books in schools is so slack that a teacher can practically produce a text-book for a few rupees. He sees that it is adopted in his own school, and one or two other schools in the neighbourhood exchange compliments with him, and he makes some money out of it.

23987. Are they translations from English school books or original ones ?—Very large numbers of them are copies of that book by Messrs. Majid and Basu. They start with something about Queen Victoria, and in almost every one of them you find the story of George Washington who could not tell a lie.

23988. *Professor Gangulee:* And the cherry tree ?—Yes. And "The Crow and the Pitcher" is almost universal in them.

23989. *Sir James MacKenna:* Is there any definite system of prescribing books for primary schools by the Education Department, or do they do just as they please ?—I think they go on very much as they please, but the prescription is nominally done by the District Boards for the District Board schools. I am not certain what the system now is, because there has been some change since I was an Inspector. I do not know the present conditions, but I think the prescription of books for primary schools is nominally done by the District Boards; but the schools do very much as they please.

23990. You have a Text-book Committee for the Presidency ?—It is not centralised in regard to text-books for primary schools. There are two Text-book Committees in Bengal, one in Dacca and one in Calcutta, and they put the books on the list.

23991. That is for high schools and the University ?—Yes.

23992. *Rai Bahadur Banerji:* The District Boards have to make a selection out of this prescribed list ?—Yes.

23993. *Professor Gangulee:* Who is responsible for making the list ?—The Committee. The department is now revising the whole system, because there is such a large number of books in the list that it is really no guide or help at all.

23994. *Sir James MacKenna:* As Principal of a Teachers' College, what are your opportunities for inculcating your ideas into the minds of your pupils ? Are you more

or less bound by a rigorous course, out of which you cannot go very far ?—We are very fortunately situated here, because the new Dacca University courses are drawn up by a Committee on Courses, which consists of the staff of the college and one outsider, so that we can alter our courses almost every year. I think that, with the exception of this year, we have made some modification every year since the Dacca University was instituted. It is very easy to change a course, and the University is a very good master; they do realise the disadvantages of a cut-and-dried course.

23995. I was wondering if you had opportunities of inculcating some of the various ideas which you yourself have about educational improvement ?—I think one has all the opportunities one wants.

23996. Obviously, it is from your teachers that you get good work going ?—Yes, but of the 80 teachers I am training this year, only about half a dozen are Sub-Inspectors who are going to primary schools.

Still that is a little.

23997. *Professor Gangulee:* Do you have agricultural subjects in the curricula of your Teachers' Training College ?—No.

23998. None at all ?—No. I do not know that they would serve any purpose. If a boy goes in for study in a high school, it means he is lost to agriculture. He is the one extra in the family that the father has got no room for on his land.

23999. From what class of people do your students come ?—They are B.A.'s.

24000. They come to you for training ?—For training, mainly to be sent into high schools; it i in the normal schools that we want agricultural education.

24000*a*. They do not get any idea of education in rural economics ?—I do not think that the subject would be required at all there; it is useful in the normal schools.

24001. *Mr. Calvert:* Is not your inspectorate taken from your College ?—It is the demand for the specialist that has to be considered. Supposing one had agricultural teaching in the central schools, I imagine that, for the inspecting of the agricultural side, one could make special arrangements.

24002. Professor Gangulee's question was with regard to rural economics ?—One could make special arrangements for inspecting that subject in the central school by getting the Agricultural Department to train a certain number of men. I do not think it would be necessary to make arrangements for that in this Training College. If you appoint one or two men who are also qualified in agriculture to the Education Department and then give them training as inspectors, that would serve the purpose.

24003. *Professor Gangulee:* But these teachers will have to come into contact with rural life; their profession will bring them into touch with the rural population ?—Yes, that is true. But if there is only a year's course we could not do very much; we could only polish up in the College the things they know already, and teach them the professional educational part.

24004. What about scientific education, nature study, for instance ? Do you teach the B.A.'s that come to you the method of teaching science, or anything of that sort ? —There is a proposal in that connection before Government. Two years ago, I proposed that we should be allowed to teach biology, and I hope that we will get the money for that next year.

24005. Up till now nothing has been done ?—We used to teach physics and chemistry: it was found to be no good and we dropped it. It would be useful to teach the teachers some biology. It was not specially as a rural subject that I thought it would be valuable, but I thought it would be valuable from the hygienic and moral side.

24006. A scientific outlook in the teacher is always valuable ?—These are optional subjects; they are not compulsory.

24007. On page 510 you make a reference to national psychology. What particular aspect of national psychology have you in mind ?—I have been thinking of it since I submitted my note. I do not think national psychology is the root cause. 'National psychology' is a vague term. The use of the term 'national psychology' implies that the nation has some congenital deficiency in organising ability. No nation is pure stock and organising ability is not a Mendelian characteristic. I think the real root cause is not national psychology, but lack of educational tradition. When they started it in England, there were the Lancaster schools. They could say that they wanted a school designed on those lines. There is nothing like that in Bengal. There is no proper system of primary education anywhere in the Province that we can start from; I think that is the real thing; it is lack of an educational tradition.

24008. You do not mean to suggest that we have not an educational tradition in this country ?—I mean that there is nothing that you can start out to imitate. If you want to start a system of primary schools, you must say that you want them after a particular pattern.

24009. Are you familiar with the rural life of Bengal ?—I have been touring round doing inspection work.

24010. What are the serious handicaps or obstacles to developing rural schools into community centres, as you would like to do ?—Chiefly water in East Bengal, and the extreme dislike or timidity of parents about sending their children any distance to school. From the figures given in the *Survey*, I think I am correct in saying that about 64 per cent. of the children mentioned in the *Survey* walked a quarter of a mile or less to school. They have got no idea as to what distance a child can walk to school. Of course, in certain parts of the country during the monsoon, it would be very difficult to organise economically; using the system of central schools that I propose one would have to lose money on one half of the Province and gain it in the other half.

24011. What about the school in a big village, where the children need not walk great distances ? Could you not develop that particular school into a community centre ?—I think that certainly might be done in the big village. I am thinking of a central school as a community centre, with its outlying feeder schools in neighbouring villages, but there would be difficulty with regard to that in the flooded areas.

24012. I wonder whether you can tell us why it is that we could not develop that school in the big village into a community centre ?—I think it could be done, if one had the power to make it the one school in the village; at present in big villages there are several schools.

24013. You make a very interesting suggestion in your note that the Co-operative, the Agricultural and other Departments of Government could make the school the centre of their work. When they visit the village they could hold their meetings there, and they could discuss problems with the villagers in that school. In that way you could develop it into a community centre ?—I think it could be done, but nobody has ever tried to do it.

24014. So it has not been tried ?—No.

24015. You ascribe the failure to national psychology ?—No; I think that the community centres are a comparatively new idea to India. It was first mooted in the Fleming Report.

24016. I want to ask you one or two questions about adult education. It is officially stated that about 39 per cent. of the people educated in India relapse into illiteracy within five years of their leaving school. Do you agree that that situation calls for an adult education movement in India ?—Yes, certainly.

24017. It is a case for carrying on propaganda for adult education ?—I think that relapsing to illiteracy must mean that they are not properly educated. I cannot conceive how one can become illiterate if he is properly trained. If you read and enjoyed fairy tales in your youth and shut yourself up in prison for ten years, you will still never forget how to read.

24018. The adult education movement in Great Britain, as you know, was followed up by University Extension. There is the Workmen's Education Society and many other organisations. Is there any organisation in Bengal that you can think of that might take the initiative in this direction ? Who is going to carry on this adult education movement ? What agency would you look to ?—I think probably part of it has got to be done by the central school system. One might suggest the Social Service League, which is doing it in a small way, but this is too big a job to be entrusted to private agencies. It has got to be organised, and it ought to be done by the central school.

24019. Do you think the University could take part in it ?—I do not think so. They might do a little here and there. The University students have a Social Service League and they ran a night school here; but it is very spasmodic. I tried to help them but they were not very keen. The movement has got to have money and organisation behind it and must be done systematically. Private agencies can help, but they are not sufficient. It is much more important in India than in England; in England there are lots of ways by which adults are educated, but here it is a crucial point.

24020. A University Extension Service could be organised ?—They might give one or two lectures in villages, but we want something permanent. There must be somebody to do the donkey work.

24021. Do you think the co-operative movement could be utilised for this purpose ?—I think education is mainly the duty of the Education Department. Others may help, but the main responsibility, the donkey work, has got to be done by the Education Department. It should arrange for the lecture and say to the Co-operative Department, "Here is the hall at your disposal; we shall be only too delighted if you will give your lectures here; you can exhibit your lantern slides here,"—and so on.

24022. *Mr. Calvert:* Is it not begging the question ? You say the Education Department is responsible ?—Adult education should be organised by the Education Department, but they may ask others' help. One could not make the Co-operative Department responsible for the adult education of a certain area all the year round. Their business is co-operative credit.

24023. Are you not in danger in using the word "education" in two uite different meanings ? Is not the Agricultural Department an education department ? Is not the Public Health Department an education department ? Is not the Co-operative Department an education department ?—Quite so. I am referring to the organisation of the thing. Someone has got to be there and see that everything is ready and tell the people about the lectures and so on. He must see that the hall is ready. The organisation might be done by the central school, and all these other departments would use that organisation for their educational efforts, instead of each having their own organisation.

24024. *Professor Gangulee:* You cannot think of education by compartments, can you ? Education is alive, is organic ?—I think each department should have a decent share in it, but someone has got to be responsible and someone has got to do the spade work.

24025. When the Maclagan Committee sat and reported on the co-operative movement, they laid stress on the fact that the backwardness of this country was largely due to stagnation; that was precisely the word they used. How can you remove that stagnation without educational forces working in conjunction and co-operation with the co-operative movement ?—I think that is quite right; but the organisation has got to be done by somebody.

24026. I want to find out from you, if I may, whether we have in this country any organisation which could be utilised to make a start in the adult education movement. First I asked you whether we could utilise the Universities or the Colleges; then I wanted to know whether the co-operative societies could be utilised. Now I want to ask you whether the weekly rural markets or the *hats* in the villages could be utilised for the purpose ?—I think it will be more useful if I just indicate to you what I mean by adult education, because, we are rather at cross purposes. I do not deny that each department has got its own propaganda to do. By adult education I rather mean that there should be a certain place in the village where the grown up man can go and get teaching in a class and can say; "I want to study such and such a subject". There must be classes held as they are held in the evening by technical institutions in England. Or if the man is busy all day long and his available time is very spasmodic, I think, there is a considerable future for the sort of correspondence course where the man gets his lessons, studies them at home and brings them back after a time as soon as they are ready. If any particular department wishes to run a course in its own particular subject, there is the organisation open for it to run that course. But I was not referring to the sort of propaganda of occasional lectures in *hats* and village halls.

24027. What would be the organisation which would co-operate with all other various departments and organise these courses ?—That should be the central school.

24028. Just as in England, where they have the Workmen's Education Society organising series of lectures in the various parts of the country ? Would you have an Association like that ?—I would have a central school.

24029. Which would co-operate with the Co-operative Department, the Public Health Department, the Agricultural Department and so on ?—Yes.

24030. And also utilise all these agencies in the country, the weekly *hats*, the festivals and so on ?—The weekly *hats* are outside the job of the central school master. His job is to institute lectures in the school building. The other work should be done by the propaganda agency. Still, that is a minor point.

24031. What is your idea as regards agricultural training being introduced as an optional subject in the Matriculation course ?—I have no very definite idea about that. I think the boy who comes to the Matriculation class does not mean to go back to the village as a cultivator, and if you introduce that subject it will rather tend to make him hope to get some sort of job, say as an Inspector in the Agricultural Department. But I am rather doubtful about that; I do not know what the attitude of the boy would be.

After all, matriculates have got a lot of work to do in learning English. The Intermediate stage might be more hopeful.

24032. Do any of your students in the Teachers' College visit the Dacca Farm ? Do you take them there ?—Yes ; they go out each year.

24033. *Mr. Calvert :* On the first page of your note you criticise certain things. You speak of the carelessly administered system of small grants-in-aid, the lack of policy, inspecting officers not being trained and so on. Who is responsible for this state of things you are criticising ?—It is very difficult to say.

24034. Is it not your department ?—Yes, I thought you were asking where in the department the lapse occurred.

24035. If these defects have been noted, why do the defects continue to exist ?—Defect No. 3 of course is gradually being dealt with, but only in a very small way ; the training college in Calcutta has only just been opened ; they have not got their new courses going yet ; I hope they will have a special course for inspecting officers. " The lack of any policy as to the distribution of the grants " is due to lack of training in the Sub-Inspectors.

24036. These are really defects in the department which the department itself can correct ?—Yes.

24037. Without any further stimulus from us or from Government ?—I think stimulus is needed. The extent of the defect is not generally realised ; I mean, it may be realised in Writers' Buildings, but I doubt whether the average Additional Inspector realises the harm that is done by the present system of distributing grants. I doubt whether a grant-in-aid system is practicable for a general system of education.

24038. But the present defects in the grant-in-aid system can be removed by the Department itself without any recommendation from us asking Government to interfere ?—It would be very difficult to set things right now by removing grants from schools and so on ; the harm has been done.

24039. *Professor Gangulee :* How would you propose to remedy it ?—By organising a small area and seeing how best it could be remedied. We should certainly need powers to control the opening of schools and to say that people may not open a rival school.

24040. You need legislation to do that ?—I think it probably would be necessary ; I cannot see any other way of controlling schools that are not wanted.

24041. *Mr. Calvert :* Later on you refer to the parent's need of the children's labour ; do you think that the need of the children's labour is a cause of absenteeism from schools, or is it just the parents' laziness ?—I cannot say how far it is really necessary for them to use the labour of their children ; but they do ; and I think that is an important cause of absence from school. In one town the children of the sweeper class were able to earn something and they were taken away from school because of the actual value of their earnings. In other cases, I think they are just used when they are useful, and when they are in the way they are sent to school.

24042. We have had both kinds of evidence ; some say that the children's labour really is required ; others say it is not required at all, that it is merely an excuse and is not the reason ?—I am not prepared to say to what extent that is so ; I think that is a question which a Bengali who goes inside the home would be able to answer better than I can.

24043. You suggest compulsory education is needed for two purposes ; but you do not mention economy. Would not compulsory education, even in a small area, lead to much more efficient utilisation of the same amount of money ?—I think more money would be required, but the money would be used more effectively if compulsion enabled one to produce an organised system of schools in that area instead of the present chaos.

24044. Actually, with your present number of teachers, with a local compulsory system ; you could educate far more children than you do now ?—We could use our existing facilities more economically by putting one teacher to teach one class of 30 children instead of teaching a fluctuating number divided into four classes ; we should make better use of what we have got now ; but, of course, it would cost more to educate all the children than the small percentage who are now being educated.

24045. In view of this list given us by Mr. Oaten showing 917,000 in Class I and only 87,000 in Class IV, which I take to be the literacy stage, you would get better value for your money with 300,000 children in each class ?—Yes ; you would get better value for your money if you had larger schools with four teachers, or centralised schools with the top classes grouped under specialised teachers and one teacher teaching one class. You

would not get better value if you did what they have proposed to do in one Municipality, where, when I asked them how they would organise their compulsory education, they said, "We have now so many schools, we should then have so many more." They would have had about fifty schools; they had no idea beyond that of the one-teacher school. If those schools were organised, there would be considerable economy.

24046. The objection that compulsion would involve more expenditure is by no means universally accepted; it has been urged that compulsion would mean economy, and that so far from being unable to afford compulsion, you cannot afford this present haphazard method?—Under compulsion the education which would be given would be far cheaper per child and more effective. Well, I will not say cheaper, but certainly more effective and giving better value than at present.

24047. For your 30 lakhs a year you would turn out a vastly larger number of literates?—Yes.

24048. You say we must consider what can be done to give the ordinary teacher some agricultural bias. Do you attach importance to an agricultural bias being given to the teacher?—Yes, I think it would be a valuable thing to do. That was said rather with reference to the work of the *guru* training school. Personally, I should like to see it provided as a selective subject, to have a range of subjects from which the teacher would choose one. I do not think it is much use making it a compulsory subject in all *guru* training schools, as some men have no natural aptitude for it.

24049. I am not speaking of the school curriculum?—But I am thinking of the curriculum for training teachers.

24050. Which do you think is more important, the curriculum or the teacher?—The reference here is, "We have also to consider what can be done to give the ordinary teacher in the ordinary primary school some agricultural bias and enable him to make some use perhaps of the school garden. Such teachers are trained at *guru* training schools"?—The suggestion is that it might be possible to give certain of the teachers of the ordinary small primary schools, as they exist at present, a certain interest in that work.

24051. We have been told that the teacher is more important than the curriculum?—I certainly agree with that.

24052. And it is more important to have the agricultural bias in the teacher than in the curriculum?—Yes, and you get that in the teacher by giving that as a subject in the training course to those teachers who have a leaning in that direction and giving them facilities for developing that line of interest.

24053. On page 512 you refer to some of the main causes of illiteracy, but you do not there mention the teacher. Do you not think your defective teachers are a cause of illiteracy?—The inefficiency of the system as a whole.

24054. The inefficiency of the teachers?—Yes, that is one of the causes. Of course, under present conditions with four classes the best teacher in the world could not do anything. For example, the Sub-Inspectors of Schools are graduates and some of them are very able men; as part of their training I put them to teach in primary schools with two classes at once, but they cannot do very much, and the best of them can only make a very poor job of teaching four classes at once. No man can teach four classes at once; a genius could not do it.

24055. But if your teachers stood out in the countryside as fine examples of what education can do for a man, do you not think they would have more success in removing illiteracy?—Yes, I think they would; but then there are other examples of the advantage of education; I mean the teachers are not the only educated people in the village. I think one of the causes of illiteracy is that the social position of the primary teacher is not good and he is not held in very much respect; he does not carry much weight.

24056. That is a great defect in the whole system, is it not?—That is one of the great defects, yes.

24057. Would you go so far as to say that a really first class teacher could surmount the difficulties of the system?—You mean if we staffed the present schools with the best teachers obtainable?

24058. Yes?—No; I think they would break their hearts.

24059. Similarly on pages 513 and 514 when you are dealing with adult education you do not mention the teacher; do you not think the teacher is an important factor in the success or failure of adult education?—I am not quite sure what that question means.

You mean that the influence of the teacher is important in persuading adults to come to him for education ?

24060. Yes, in attracting adults ?—If we refer back to the beginning, supposing there were a central school with a man at the head of it who really had personality and energy, certainly by his personality and the respect in which he was held he would be able to make adult education in his area a success where a man with less personality and energy would fail.

24061. A teacher who could attract adults to his school by his personality would have far better chances of success than one who took up teaching as a method of earning a few extra rupees a month ?—Yes ; and a fairly big school like a central school would be able to pay an adequate salary to a schoolmaster who had those qualities. At present these tiny little schools of thirty children and a few rupees grant do not get that type of man, and it would be a ridiculous extravagance to provide that sort of man for such schools. One of the reasons why we want bigger schools is to get, above all, a better headmaster.

24062. We were told by Mr. Oaten that it is no part of the policy of his department to insist on getting a maximum number of primary school teachers from the agricultural classes, whereas in the Punjab it is the policy of the department to get as many teachers as possible from the agricultural classes ; in the Punjab education is doing well, while in Bengal we are told it is not quite so successful. I was wondering to what extent that is due to the personality of the teacher and the class from which he is drawn ?—I think the most important thing in a teacher is energy and initiative, wherever he comes from.

24063. Would you not add sympathy with his pupils ?—Yes, certainly ; naturally, other things being equal, I would rather have for a rural school a man who comes from the country and is familiar with country life, but I would not make that an absolute rule and say that a particular appointment was only open to people who had lived so many years in the country. The most important thing in a teacher is energy and initiative, and if you cannot get a man from the land with energy and initiative, you must get him from elsewhere ; but he must have energy.

24064. You talk of removing "unteachables" from the elementary classes. What do you mean by that expression ? Do you refer to children who are sent to school and are too young to learn ?—They are sent merely to get them out of the way in the homes.

24065. Were you thinking of the menial class ?—No. I simply meant children who were too young.

24066. On this question of wastage in classes I to IV, is any encouragement inadvertently given in reports by stressing merely numbers on the rolls ?—I think that is the tendency. I have often looked back with a certain measure of doubt upon the abolition of the system of payment by result. There is nowadays too much swelling of mere numbers on the rolls.

24067. Was much stress laid on the increase of numbers in the rolls and not on the increase of numbers in the IV class ?—Yes ; there is not enough stress on the actual results.

24068. Are your grants based on roll numbers ?—Yes, they tend to be.

24069. They are not based on class IV ?—No.

24070. If you based them on class IV would that not encourage the production of literacy ?—I do not know what the effect of that would be. It might be based on the number of boys who passed a certain primary examination in the school. But then of course there might be some fraud ; they might use the same boy over and over again.

24071. With regard to your training college students, you told Professor Gangulee that they had to go to the Dacca farm. Do you attempt to get them lecturers from the Co-operative Department, or the Public Health Department, or the Agricultural Department ?—I should like to explain that point by saying that my training college students are meant as teachers for high schools. They are B.A.'s and they come to me for only nine months. I cannot possibly hope to teach the men in that time any new subject. I can hope to open their minds a little bit, but our main duty is to teach them how to teach, and we teach them the essentials of the educational theory. Supposing somebody wrote to me and said, 'I want a teacher qualified in agriculture,' the way one would set about it would be this ; one would want a man who knew something about the matter to start with.

24072. But supposing what was wanted was not somebody qualified in agriculture but some one who took an interest in agriculture ?—Well, these men are teachers of high schools, and personally I am very doubtful whether agriculture in the high schools

is either a practical proposition or is wanted, or whether the right place to introduce it is in the high school, and, therefore, I have not made any attempt in my college to teach agriculture to these men who are going to the high schools. It is not a subject which they would teach under present circumstances. If agriculture were made a subject in the Matriculation examination, it would be up to me to produce teachers for that.

24073. *Professor Gangulee:* But could not a rural outlook be provided ?—Yes, but the time is so very short that we have not been able to do very much of that. I like them to see something and to get an idea of what is being done at the farm as a part of their general education. But my function here is to produce secondary teachers and I have got my work cut out. One has not got the time to remedy the defects of their general education. We have a course on the problems of education in Bengal, in which the problem of village education and the sort of thing we are discussing now are discussed, and that is where they would deal with these problems.

24074. *Mr. Calvert:* Do I take it then that you do not attach much importance to your students having a general knowledge of the work being done by the allied Departments of Agriculture, Co-operation, and Public Health ?—Certainly I attach great importance to it, but one cannot do very much in the short time at one's disposal. In that short time we do all we can. They go out for a visit to the farm and see Mr. Griffin's work in the Public Health Department, and he comes and lectures at the college. It is part of their regular routine. They go round the various Public Health Departments in the town. Then again, we ask various outside lecturers to come and talk to us. This is not only confined to the Public Health and Agricultural Departments, but the Police Department are also asked to come and lecture on their working. This is all a part of the general education of the college. As I say, the time is so short and much cannot be done. We do the very best we can.

24075. *Rai Bahadur Bannerji:* Who is Mr. Griffin ?—He has been building up the sewage system of Dacca and doing other things.

24076. *Mr. Calvert:* In the training centres for primary and middle schools, is there any attempt made to teach these teachers rural economy and the economics of village life ?—No ; but in the proposals for reorganising normal schools that is one of the subjects, and this would in my opinion bring about an immense amount of good.

24077. You have probably heard of Moga in the Punjab where technical courses in village economics are given ?—Yes.

24078. Do you not think that a great deal of good might result from getting the teacher interested in the problems of village life ?—I think it is the most essential part of the work of the normal schools.

24079. One suggestion made to us is that Inspectors of Schools should be drawn from Bachelors of Science or Agriculture ?—What is the idea of doing that ?

24080. To ensure that your Inspectors of Rural Schools have some knowledge of the countryside and its problems. You take B.A.'s ; why not take B.Sc.'s ?—This college is spending most of its time turning out ordinary high school teachers and we have to do the best we can for the Sub-Inspectors to fit them into our existing organisation. The ideal would be to have a special training course for the Sub-Inspector which would definitely fit him for his work and in so far as the study of matters of agriculture and rural economics goes, these things would be a necessary part of the course. At present we have to compromise because there are only about five Sub-Inspectors appointed each year.

24081. *The Chairman:* How old is the average man when he goes in for his Sub-Inspectorship ?—In the twenties.

24082. *Mr. Calvert:* Do you take graduates in your college ?—Yes ; graduates in arts and science.

24083. Have you any objection to taking graduates in agriculture ?—I should have no objection to taking graduates in agriculture for training as Sub-Inspectors, and I think that it might be useful to do so, except that we could not get enough men for all the vacancies at once.

24084. Would you take half the men graduates in agriculture to begin with ?—That would tend to limit the range of selection or else there would be a tremendous rush of men to take up agriculture in the Universities with the idea of getting sub-inspectorships.

24085. But why should that strike you with a feeling of horror ? Why should not your Inspector know something about agriculture ? Why do you give preference to men with history and such like qualifications over agricultural men ?—I do not think that

we give preference. In appointing a Sub-Inspector one naturally appoints the smartest fellow.

24086. What do you mean by the smartest fellow? Do you mean smart in understanding village problems?—One who has got active brains. But if you limit your range, if you say for instance that this man has got to be a Mahommedan or a Hindu, then you simply limit the range of selection and naturally you do not get the very best men.

24087. I do not understand your outlook. Do you admit that if you had in your rural schools really inspired teachers you would get better results?—Yes.

24088. Now where is that inspiration to come from if it does not come from your Inspectors?—I think I could make the point clear in this way. The first essential of an inspecting officer is the man himself. We want the man with the most active brains, with the greatest energy, with the greatest enthusiasm, and we have got to have him irrespective of anything. When we have got them we can certainly take into consideration, other things being equal, the desirability of having men who have been brought up in the countryside and have full sympathy with country conditions and difficulties. Having got them, if we need certain extra subjects we can just give these to the men. But having got second-rate men we could not give them first class brains. We can add knowledge afterwards through a specific course. I am against any limitation being put on the range of selection as this tends to get second class men.

24089. But why should you not attempt to select the best man for the post, the man who is in that line already, instead of getting the best man in history for instance, to take up this job in agriculture?—I think that might be done eventually if there were sufficient graduates in agriculture and a wide range of selection.

24090. *Mr. Gupta:* How many Sub-Inspectors do you recruit every year?—I do not know what the total number would be for the whole Province annually.

24091. *Mr. Calvert:* You would like to have men who are active, energetic and enthusiastic, but surely those qualities vary with all subjects. For instance you might have activity at games and enthusiasm for bridge. What I want to know is, why you would not like to get men who are interested in agriculture also?—That is certainly desirable, but I would not like to see any specific limitation made to the effect that only men with certain qualifications would be taken.

24092. But at present you are taking none with agricultural qualifications?—I do not say that we bar them, but there are not many B.Sc.'s in Agriculture in Bengal I think. Their number, I think, is very small. The rule with Government is that a man nowadays must have been trained before he can be appointed. I do not remember any B.Sc. in Agriculture applying for training in my college.

24093. But if the Government were to issue orders that B.Sc.'s in Agriculture should be appointed to inspectorships?—If Government said that preference should be given to B.Sc.'s in Agriculture, since the unemployment problem is very acute, it is not unlikely that such men would come to the college for training with a view to obtain inspectorships; and if, in the course of the training, these recruits were found to be men of the required type, they would certainly get these posts. I do not think that any harm would be done if this were introduced. All I say is that I would not like to make any hard and fast rule.

24094. Now, in the evidence which you have just given I gathered that you were judging men by their examination ability, because a man who had passed high in his B.A. examination was given preference over the man who had taken only his B.Sc. in Agriculture?—I should not say that one would judge them entirely on their examination results, because examination results are very deceptive. I would put it in this way: The number of Inspectors we appoint is five per annum. If a rule is made that these must be Bachelors in Agriculture and there are only five such Bachelors of Agriculture in the Province, then we have got to appoint those five men even if one of them passed at the bottom of the third class in Agriculture and is a very feeble sort of fellow. Other things being equal, namely, the general records, the physique, the impression you get from the interview and the testimonials, the man with the knowledge of agriculture would be the more suitable man. That is a recommendation for him.

24095. Assuming that there is not any defect in the general side, you would give preference to the agricultural man?—I would not like to make a fixed limitation, because then you would be compelled to appoint these five men even if one of them is a very hopeless fellow.

24096. *Rai Bahadur Bannerji:* Were you ever in West Bengal?—I was Inspector of Schools in the Presidency Division.

24097. You admit that the condition of things in West Bengal is quite different to the conditions prevailing in East Bengal ?—Most of my touring for the survey done in 1918 was done in West Bengal because I knew less of West Bengal.

24098. If any experiment is tried in any particular area in East Bengal regarding compulsory free education, then necessarily a similar experiment has to be tried in West Bengal simultaneously ?—Not necessarily simultaneously. One would do it first in either West or East Bengal and then consider what modifications would be necessary in transplanting it or adapting it to the different conditions of the other side of the Province.

24099. That would mean eventually that one part of Bengal, either East or West, would have to wait ?—The experiments might be made simultaneously or successively.

24100. *Sir Henry Lawrence:* Could you tell us what scheme you would consider as most suitable for the improvement of the primers in use in primary schools ? Would you like to have only one set of primers authorised by the Government ?—I do not think that would be desirable ; that would be rather an interference with public competition. It is an extremely difficult problem and I do not know what I am going to do. I know that the experimental primer is a valuable piece of work, but when you come to the business side of it, it becomes difficult. What I propose to do, when these particular primers are finished, is to send them to the Director of Public Instruction. I shall say that the production of these primers has cost so much and whose property they are. I imagine the Government would say, "Well, we require a certain number of primers and the men who wrote them should have royalties and Government, if they consider them useful, will encourage them." I think they would go on the list with other primers as is laid down in the new proposed Text-book Rules. They propose to give a choice of four.

24101. Are there some new proposed Text-book Rules ?—The present Text-book Rules are rather hopeless, but there are new rules under consideration and the new rules, I believe, are modelled on those in use in Assam, in which they say that there shall be only so many books on the list. If a new book comes along, it is up to the author of the new book to prove that it is better than the other books. With that system, as text-books are improved, the newer and better ones would tend to replace the books on the list.

24102. Do these text-books contain lessons on hygiene and sanitation and matters of that kind ?—The present Bengali books do not contain such lessons, but we have got a specific course of hygiene for women who can read. These books are all done for the zenanas. The English books have got lessons on hygiene.

24103. At what stage is hygiene taught ?—Hygiene in English is taught to those boys whose vocabulary is about 500 words.

24104. What about the vernacular schools ?—They have not yet reached that stage.

24105. There is no lesson at all on hygiene in the vernacular ?—We have got one book which teaches the alphabet, but that, of course, does not include any essays on hygiene or anything of that kind. The child's vocabulary is far too small at this stage. There are a few story readers for the later stage, which were done last year. We have not got on to that stage yet.

24106. What is the earliest age at which such lessons could usefully be given ?—One could do something in Class III, which contains boys of the age of 8 to 9, and a certain amount could be done with boys of the age of 9 to 10.

24107. You have a separate hygiene primer at the present time ?—At present in the primary schools there are hygiene primers. I believe the East Bengal syllabus says that hygiene is supposed to be taught without a primer, although the teacher actually uses one. But, of course, the teaching, as you will see from the verbatim lessons given here (the Survey) is rather a farce. That is largely due to the fact that the teachers are not taught hygiene very effectively in their normal schools. We have been teaching hygiene in my college only for the past five years.

24108. Do you attach any importance to the introduction of hygiene teaching in primary schools ?—I think in the higher classes of primary schools, say class IV, one might do an immense amount of good but not in the farcical manner that is reported here (the Survey). Proper hygiene teaching can be given only by the primary teacher who has passed through the normal school and who has been taught real hygiene by a man who has learned hygiene in the Training College.

24109. Do you know anything about the primers that are in use in other Provinces ?—I have not made a study of them.

24110. You have not seen them ?—No.

24111. Do you think that if a set of primers is prepared as a model it would be of value if translated into different languages in India ?—The sort of primers which we are working on, building in the letters of the alphabet one by one and the words in the order of their frequency, cannot be translated. You have to rebuild them again for every language, and it involves such an amount of labour that I do not think any author would care to do it from a commercial point of view. I think that the Provincial Governments might make a start and get some one to construct that type of reader. But it means a tremendous amount of labour, and it takes a long time.

24112. It has to be done for each separate language quite separately ?—Yes.

24113. I suppose the idea underlying the preparation of your primers is their universal application ?—The technique and the method whereby they are prepared is described in a bulletin of the University which will be published very shortly.

24114. Who is preparing that ?—I wrote an account of the procedure and that procedure is being used in the Bengali version.

24115. *Sir Thomas Middleton :* Is your Training College affiliated to the Dacca University or is it part of the University ?—It is in rather an anomalous position. The members of the Training College staff are honorary teachers of the University.

24116. You do not train for any specific diploma or degree ?—Our degree is a degree of the University and the teachers of the College are appointed honorary members of the University staff. Of course, the Dacca University in virtue of its Act may not give any external degrees.

24117. So that you have approved courses for the University ?—They take the ordinary degree of the University.

24118 How many students attend the Training College ?—Eighty.

24119. Of whom five to six are trained as Inspectors and the rest as high school teachers ?—That is about the ordinary number. It varies, of course, from year to year.

24120. The entrance qualifications are a degree, I take it, of an Indian University ? —We are supposed to give two courses ; the L. T. course is for those who have passed the Intermediate and the B. T. course is for those who are graduates. Actually, we do not take any candidates for the L. T. course, though there is a very big pressure for admission, unless they are actually sent to us by the Government of Bengal or by the Government of Assam or by Hyderabad.

24121. Are there many candidates sent who are not graduates ?—There are very few. The L. T. class list each year is under a dozen.

24122. Your course is for nine months. How many lecturers are employed in connection with the Training College ?—Six.

24123. As the course is for nine months, the six subjects are running concurrently, has each pupil six classes to attend ?—There is the general professional subject like the method and theory of teaching which all have to attend. Then there is a number of subjects from which they can select any three. Those subjects may be added to from time to time. The idea of these selective subjects is that a man takes up a subject of which he already knows something and we polish him up in that subject. For instance, if a man is going to be a teacher of English, he has already taken his degree of B. A. or M. A. in English, and in the English course I teach him English pronunciation and the art of teaching English and so on.

24124. Supposing a man wants to become a high school teacher in physics and chemistry ; you do not teach physics and chemistry and therefore all that you teach him would be the methods to be employed in teaching physics and chemistry ?—That is rather an unfortunate example. That is one of the subjects in which really our system does not fit in very well. Supposing a man is going to be a high school teacher in history, then we should take a man who has already taken his degree with history as one of his subjects. He will work through a course in which history is taught. We will polish up his weak points in history and he will also receive instruction in the art of teaching that subject.

24125. I heard you say in answer to a previous question that you had formerly given instruction in physics and chemistry but had ceased doing so now, and the question occurred to me as to how men who teach physics and chemistry in high schools get their technical qualifications ? I suppose they must get their technical qualifications entirely from the University ?—The main reason why we gave up teaching science as a subject is that practically no schools teach physics and chemistry. I believe they used to teach physics and chemistry at one time in the local collegiate school. I cannot personally think of any other school in which physics and chemistry are taught.

24126. Is that so throughout Bengal?—Yes.

24127. Then by what method is the teaching of physics and chemistry supplied?—It is done by the Intermediate College.

24128. Are there, in fact, any Intermediate colleges now at work here?—There are three for men and one for women in Dacca. Of course, the Sadler Report pointed out, what is true, namely, that the Intermediate colleges are really schools, and recommended that they should be cut off from the University and made into separate institutions, and that some of the high school classes might be joined to them. That has been done in Dacca, but even in Dacca as yet, the colleges have not been organised in small classes with school teaching, nor have they any number of trained teachers. The intermediate college man, I think, does not like to be regarded as a school teacher; he considers himself to be a "lecturer," and that is one of the obstacles.

24129. Outside Dacca, there has been no alteration since the Sadler Commission reported?—None.

24130. In connection with your scheme for central schools, you mentioned the difficulty of the flooded areas. For how many months in the year is that a real difficulty?—It varies, of course, in different places, but it is difficult for six months in some areas.

24131. In other respects, one would suppose that your conditions are highly favourable for central schools?—Even in flooded areas, of course, you might have your central schools with feeder schools strung out along the District Board roads. In certain parts there are good roads in the flooded areas but there are certain areas where roads are few and there the problem is difficult. In Chittagong it would not be difficult. You will have to consider the geography of each Union area where you propose to have a central school.

24132. You are aware that the central school idea is receiving attention in Britain at the present time?—Yes.

24133. And there the conditions are by no means so favourable in country districts, as we have not got the density of population that you have and the children have to be brought to school by motors from considerable distances?—Yes; of course distances in Bengal would be less than they are in England.

24134. You mentioned the assignments which you have prepared in connection with zenana work; have you any specimens or copies?—I am afraid I did not bring them with me; I could send you the copies; they are in the Exhibition.

24135. Just to show the type of thing that you have been doing?—Yes; I will certainly send it along.

24136. With reference to your note about a carelessly administered system of small grants-in-aid, I think you have already stated that the carelessness is due to the difficulty of getting qualified inspecting officers?—Not exactly that; I think it is due to the fact that the inspecting officers in the past have not received specific instruction in the problems of primary education. Such training as they have had has been training as secondary teachers; there has been no specific training for the inspecting officers for primary schools. I do not think that the training now is really sufficiently specialised, but that is the best we could do.

24137. *Dr. Hyder:* Is there a large diminution in the number of pupils who attend schools when the whole of this country is under water?—It gets irregular. For instance, on a day on which there is heavy rain, you will find the school practically empty, or even closed altogether.

24138. The boys have to come from two or three neighbouring villages?—Yes; they get very irregular in the rains. Of course there is a combination of causes; it is not only the water, but there is malaria of course, and the parents are using them also.

24139. What is this system of assignments? You draw up questions which have to be answered by the women in the zenana?—It is just a piece of work for a given time, just as you have in a correspondence college. They send you so much work for the week; we usually send out work for the month. You do those lessons and you answer questions on them. You do what has been set in the lessons, like drawing a map and things of that sort. When you have finished your lessons you receive some questions to see whether you have really learnt the lessons and understood them.

24139*a*. But the pupils never come into contact with the teachers?—The teacher goes round the zenanas distributing the lessons. She goes round again when they finish their assignment and brings it back to the training college. She brings it to us and we correct it.

24140. How could this deficiency of books on useful subjects in Bengali be overcome? —By creating a demand. There is not the slightest reason why they should not be produced. This is one of the cheapest countries you could possibly have for printing. The only way to overcome it is to create a demand, that is to say, to improve the teaching of reading in the schools.

24141. But at present no books on these useful subjects worthy of mention are written in the Bengali language?—Because, if you publish them they would not be bought.

24142. Is the newspaper competing with books as regards reading?—In the *viva voce* examinations in the University, one of my favourite questions is to ask the student how long ago he read a newspaper, and as often as not, the reply is, a fortnight ago. But when I ask him whether he can tell me anything of what he has read, the reply is that he does not remember. They do not read the newspaper; it is extraordinary how little they read.

24143. *Professor Gangulee:* These are graduates of the University?—Undergraduates who have just been admitted, and they have to pass a test called the English oral test.

24144. *Dr. Hyder:* What is Captain Petaval's scheme of reducing unemployment among the *bhadralog*? Are you familiar with it?—I have read something about it; I cannot say that I know very much about it. I was not very much interested in it, but I am a little doubtful of its effects. It looked to me like several other former schemes of the same sort.

24145. *Mr. Gupta:* What kind of powers would you like to take to be able to close such primary schools as are not wanted, or as are not useful in any particular locality?—I am not certain whether the mere withdrawal of the grant would be adequate. If there were a primary examination, that is to say an official examination at the end of the primary stage as there used to be, and you made it a rule that no boy from an unrecognised school was admitted to that examination, that would have some effect. There is no such examination at present. I think that would be the best way of coping with it. You cannot close the school as if it were a gambling house.

24146. You could not make it a penal offence for a *guru* to keep a school. You will either have to withhold your grant or make admission to this examination impossible for a student from a school which is not recognised. Some kind of Government recognition or District Board recognition will have to be withheld. There would have to be some such ban. You could not take any powers under legislation. What sort of legislation do you think would be suitable?—I think that the really essential thing would be this. In an area where you organised a system of schools you would probably find it necessary to have some sort of test of literacy at a certain stage in the primary course, and you could say that children from schools other than those run on an organised system would not be admitted to the test. In this country that means a lot to the school.

24147. In that way you attract all the boys to your schools; and there will be very little attraction for the boys to go to the other schools. That of course will take time?—That alone would not do. I think the parents in some cases would rather send their children to a bad school which is five minutes' walk away, than send them to a good school which was ten minutes' walk away.

24148. What about the proposed Primary Education Bill? Have you studied it? I wanted to know if the calculation of 5 pice in the rupee of taxation proposed is based on any figures that you have submitted. The cost of primary education will have to be met by the imposition of this fresh taxation. Is that based on any figures that you have submitted?—I believe that it is partly based on the estimate of the 1918 report. After all, the 1918 report is based not on the last Census but on the previous Census of 1911; so that to what extent my figures have been brought up to date I do not know. I know that Mr. Lindsay took this estimate into consideration.

24149. If we could not get the 5 pice; if, for instance, the Council only passed 3 pice, or 2 pice, could you modify your recommendations in a manner which would make only that additional income sufficient to carry out that scheme?—I do not think that in the first year it would be possible to use anything like the full yield of any tax of that kind. We have to make an experiment to find out how to do it. We have to provide the teachers capable of running the thing; it will have to be a very gradual growth.

24150. It will not be necessary to hold up the scheme if the Bill does not pass in the shape in which it is sent up to the Legislative Council?—No, so long as there is sufficient money to run an effective system in a limited area. If the money is from provincial revenues and could be distributed in certain areas, well and good, but if it means that you collect 5 pice only in certain areas, and that is all on which you have to run your system, it might be difficult.

24151. That is rather an important point in your suggestion, that we should just try it in a limited area, and if it succeeds extend it gradually in the light of experience gained. The Government could probably find the money for an experiment in a limited area ?—Yes.

24152. If the experiment succeeds, it might be a sort of definite result to be placed before the Council, to shew to them that we have succeeded. Instead of placing it before the Council without experience, it might be better to give them the results of our experiments. I am only trying to visualise what might happen if this Bill does not pass the Legislative Council. We cannot hold up our hands and say that we cannot do anything because the Council has not passed the Bill; we must move ?—There is no reason why there should not be money available for an experiment, except, I suppose, it would be the old reply that money will be made available in two years' time, after the next budget is passed, or something of that sort. The cost of the experiment would not be prohibitive, and there is no reason why the experiment should not be made before the Bill goes through. Whatever system of primary education is employed, money will be necessary, and the passing of the Bill will help it.

24153. *The Chairman :* About the problem of leakage, I suppose a certain amount of the leakage between class III and class IV is due to the fact that parents find that they cannot do without the labour of their children and take them away in order that they should work ?—Yes. I am not prepared to say how they cannot do without their boys' help. The result is that it leaves us with a less number of boys.

24154. The same applies to the leakage between class II and class III. But do you not think that the fact that class III of the primary school corresponds to the bottom class of the higher English school is responsible for some part of the leakage ?—I am not certain how much of it is accounted for by that. Of course parents do send their children to a primary school until they are old enough to go to the high school, but I cannot find out from the figures to what extent the leakage there is due to the boys going on to the high school.

24155. Is not that a sort of thing which would be very useful to know ? Are the facts not available ?—I have failed to extract them from the reports. It is difficult to separate out the classes. It would be possible to find out, say for Dacca city, by actual investigation how many of the boys admitted into Class III this year have come from primary schools. You cannot get anything from the official statistics.

24156. Then these boys who go straight from class III to the English high school ? Do they not go to the middle school at all ?—The middle school is the lower half of the high school.

(The witness withdrew.)

Khan Bahadur MAULVI WASIMUDDIN AHMED, B.L., Chairman, District Board, Pabna (Bengal)

Replies to the Questionnaire

QUESTION 2.—AGRICULTURAL EDUCATION.—(*i*) No.

(*ii*) Yes in the districts of Pabna, Bogra, Rajshahi, Rangpur, Dinajpur, Malda, Nadia, Faridpur, Mymensingh and Barisal in Bengal.

(*iii*) Yes.

(*iv*) No. The reason is the cultivators are mostly uneducated and they are not aware of the advantages to be derived from agricultural education—the blessings of such education have not been brought to their notice. The number of demonstration farms is very limited and situated in headquarters of a district far away from the rural areas. They are also carried on under a costly system and their working cannot teach people nor explain to them that the agriculturists would profit by adopting those measures.

If demonstration farms could be run economically and the balance sheet (profit and loss) were published and explained to the agriculturists pointing out to them the larger profit to be derived from the new system and if the sons of agriculturists were taken as labourers offering them suitable stipends or wages the agriculturists are likely to take more interest in agricultural education.

(*v*) If it could be made clear to the agricultural lads that they would immediately profit by agricultural education in the shape of better crops bringing them larger profit than what they would get by following the old system. Stipends equal to living wages would induce lads.

(*vi*) Yes.

(*viii*) I am in favour of :—

(*a*) Nature study that would be useful to lads in their avocation in life.

(*b*) School plots cannot give an idea of what obtains in ordinary agricultural pursuits.

(*c*) School farms—the same.

(*ix*) At present most of the pupils come to qualify them for service and they seek for such employment. They do not carry their knowledge to the field nor try to make any other use of their knowledge.

(*x*) In Bengal, agriculture is not at all profitable to middle-class people. They do not like to do manual work. The labourers are not honest workers ; they always try to cheat the employers. If by introducing new methods agriculture could be made profitable and less subject to failures owing to freaks of nature or insect pests, early floods or want of floods, the middle-class youths would take largely to agriculture.

(*xii*) By establishing small agricultural farms in rural areas by experimenting on the fields of agriculturists or near fairs, *hats* and bazars where agriculturists would have facilities for seeing with their own eyes the advantages of new systems of agriculture.

(*xiii*) Administration and finance should generally be by Government and where enthusiastic people would be available such enterprise may be subsidised by Government on suitable conditions.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(*a*) In some demonstration farms new varieties of crops have been introduced successfully, such as cultivation of *Chinsura green* jute which gives larger profits to cultivators and cultivation of new varieties of sugarcanes with better system of crushing and preparing molasses of higher quality ; these have induced people to take to the cultivation of those crops and to seek expert advice and these have improved the practice of cultivators.

(*b*) In case of field demonstrations similar crops as are grown in the locality should be raised and accounts should be kept and profits should be explained to cultivators. New varieties of crops may be raised in some plots and better results should be brought home to the cultivators. Even if they cost more it should be explained to the cultivators how they can avoid some expenditure and can grow those crops at a lesser cost and with profit.

(*c*) Besides working in the demonstration farms, the experts should visit the fields of the cultivators and select some plots where the cultivators should be induced to follow their advice in the process of ploughing, sowing, weeding and gathering crops and making them fit for market and if they can show better results the cultivators would be induced to seek their advice.

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(*d*) I am aware of great success of growing *Chinsura green* jute and *indrasail* paddy and failure of *kataktara aus* and potatoes in some alluvial soil. Failure of *kataktara aus* is due to bad selection of areas as it cannot stand drought and failure of potatoes is also due to bad selection of areas as in alluvial soil its plants grow luxuriantly but are eaten up by insects which largely swarm in these tracts.

QUESTION 4.—ADMINISTRATION.—(*i*) No. In both cases the number of officers with lower pay should be increased. Larger number of demonstrators can approach larger number of cultivators. If veterinary students were taught in the vernacular with equal expenditure to local bodies (District and Local Boards and Municipalities) a very larger number of doctors could be entertained which would afford much greater facility to cultivators for treatment of their cattle.

(*ii*) No. Owing to abuses prevailing in these services none but the shrewd Marwaris and dealers venture to entrust their commodities with these officers. Their conduct with the public shows as if they do not get any pay from those departments but they are licensed to live on the gratifications offered by the dealers.

(*iii*) Existing roads are quite insufficient and ill-kept and they cannot afford sufficient facilities to cultivators or cartmen who have to carry produce to market.

(*iv*) Informations gathered and supplied by the Meteorological Department do not reach the cultivators, even ordinary farmers.

(*v*) Postal Department render, useful services yet greater facilities should be secured by increasing the number of postal officers taking the services of village teachers and grown up pupils who may serve as Postmasters and peons at much lesser cost.

(*vi*) At the present stage wireless is little known and is of little use to cultivators Telegraphs are doing much good both by carrying information and transmitting messages to distant places.

Abuses in the railway and steamer services may be removed by appointing better educated men in these services. It is an open secret that some semi-educated station masters make princely income besides getting large supply of food materials not only for themselves but for a large number of friends. They have also to share their profits with superior inspecting staff.

QUESTION 5.—FINANCE.—(*a*) Loans should be advanced to cultivators mainly for productive purposes. Long-term loans at a moderate rate of interest and easy terms should be allowed to cultivators for purchase of lands, cattle and for building where necessary. Short-term loans at cheaper rates of interest should be allowed for purchase of provision, seed, fodder and for wages of labourers. Government should generally come forward with *taccavi* advances to individual cultivators without insisting on joint bonds on joint loans by several cultivators which system is open to many objections. The present Co-operative Societies Act which insists on unlimited liability in case of agricultural societies is also open to serious objection and the system is getting unpopular. The ignorant ryots have scarcely an idea of joint and unlimited liabilities when they are forced to contribute to any amount, pending on the discretion of the liquidators, they realise and lament their situation. Already there is a growing tendency not to join any co-operative society. Moreover owing to illiteracy of many and improper conduct of the literate few many abuses have crept into the societies. To my mind each individual member's liability may be unlimited so far as his own debt is concerned but his liability for contribution for default of others should be limited to shares.

(*b*) Yes. *Taccavi* should be advanced to individuals on easy terms but strict supervision should be kept so that none can make default when he is able to pay.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(*a*) The main causes of borrowing are—

(*i*) (1) Purchase of cattle, (2) supply of food when provision runs short during the months of April to July, (3) hire of labourers during cultivation season from April to July, and (4) marriage of children and funeral charges of parents.

(*ii*) Sources of credit are the village *sowcars* who demand exorbitant rates of interest during the months from April to July.

(*iii*) Failure of crops or proving insufficient to leave margin for repayment of loans and often improvident habits of agriculturists who are generally uneducated and wanting in foresight.

(*b*) Steps should be taken to provide loans at a lower rate of interest but with strict supervision for enforcing instalments. The law of *damdopat* should be enforced. The operation of the Usurious Loans Act is not at all satisfactory. The judicial officers have been allowed to use their discretions which are seldom used in favour of the debtor, as

most of the judicial officers either belong to or have sympathy with the money-lending classes.

(*c*) Yes. The cultivators should not be allowed to mortgage or alienate all their lands and rates of interest should be fixed. Provisions of the Law of Limitation should be changed. Fresh start of limitation from the date of payment of interest or part of principal should not be allowed in the case of cultivators. Those provisions of the Limitation Act (Sections 20 and 19) are open to much abuse in many ways. The following are among the abuses :—

(*a*) False entries are very often made to revive barred debts and to get fresh start of limitation without the knowledge of the debtor and (*b*) by accumulation of heavy interests the debtors are crushed.

(*c*) It is a patent fact that bonds are seldom returned to debtors (cultivators) even when bonds are satisfied. So long as good feelings prevail between the parties no harm is generally done but when there arise any differences the barred bonds are revived by endorsing false entries.

(*d*) Often barred bonds remain with the creditors and after his death his heirs being in possession of them think that these bonds are really unsatisfied and they put false entries of payment of interest. The courts seldom believe the plea of payment even when supported by substantial evidence so long as the bonds remain in possession of the creditors.

(*e*) It is generally found in cases of enmity with a cultivator people often forge bonds for smaller amount as bonds for large amount without being registered are looked upon with suspicion and by putting series of false entries of payment, suits are brought after six or seven years when the amounts have increased to a big amount sufficient to crush the debtor. These are again the reasons for my advocating the provision of the law of *damdopat*. Cultivators should not be allowed to mortgage or sell more than half their lands. Non-terminable mortgages should be prohibited.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—(*a*) If the cultivators could be induced to have joint cultivation but to have shares in the produce in proportion to the lands held in such joint cultivation then loss consequent on excessive sub-division of holding may be minimised. This can be attempted through the co-operative system.

(*b*) The cultivators have special liking for his own land and quality of land varies within a very limited area. So the cultivators fight shy to exchange their lands. So the difficulty can be obviated by legislation providing safeguards in the shape of adequate compensation when a tenant has to part with a land of superior quality for a worse land especially when he had improved his land by his capital and labour.

QUESTION 8.—IRRIGATION.—(*a*) In the Pabna district, there is hardly any irrigation, but introduction of irrigation system would greatly improve both quality and quantity of produce. Owing to failure of rain during the sowing season, late sowing takes place resulting in damage due to destruction by early flood in the area subject to annual inundation.

QUESTION 9.—SOILS.—(*a*) (*i*) In the Pabna district, millions of acres of land have gone out of cultivation by formation of *bhils* (water-logged area). In this district there are many rivers and rivulets to which the rain and flood water could find their way through channels. But in course of time the mouths of these channels have silted up and excess water cannot go out with the subsidence of annual flood. The soil does not dry up in time to allow cultivation. Even when these lands are cultivated crops are often damaged by flood as the water does not rise with the river level but flood water enters by overlapping the banks, and water rises suddenly and paddy and other growing crops cannot keep pace with the rising water.

(*c*) Government should encourage free recourse to the Bengal Agricultural and Sanitary Improvement Act (Act VI of 1920) without leaving its operation to private individual or local bodies who have scarcely sufficient funds to finance such big operations.

QUESTION 10.—FERTILISERS.—(*a*) Education to the cultivators and demonstrators by Government officials of the utility of fertilisers by inducing the cultivators to preserve dung and refuse matters and applying to their fields and showing them the difference of produce.

(*b*) By legislation and teaching people how to detect such adulteration.

(*c*) By free distribution of samples and by demonstration in small fields the difference in produce of two adjacent fields, one treated with fertilisers and other ordinary, may be demonstrated and explained.

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QUESTION 11.—CROPS.—(*i*) By introduction of better system of cultivation and irrigation existing crops may be improved both in quantity and quality.

(*ii*) There are ample scopes for introducing new crops. In this district there are lands which cannot produce crops that are generally grown in the district but they are capable of growing new crops such as ground-nuts, cowpeas, various kinds of grass including other fodder crops.

(*iii*) There should be suitable centres for distribution of superior kinds of seeds.

(*iv*) Of late this district has fallen a special victim to wild boars. This seems due to the fact that when the anti-partition agitation and the non-co-operation movement prevailed in the Province, indiscriminate cancellation of gun licenses took place, and the country was left quite unprotected and the number of wild boars increased to an enormous extent even in well cultivated tracts such as Serajgunj sub-division where a wild boar was a curiosity twenty years ago. There should be a regular campaign for destruction of wild boars. Reserve police during the winter season may with advantage be employed to destroy wild boars.

(*c*) *Indrasail* paddy, yellow *tanna* sugarcanes that are being gradually introduced in this district are giving more crops of better quality.

QUESTION 12.—CULTIVATION.—(*i*) Even existing system of tillage may be improved if the cultivators were provided with more capital to purchase healthier and stronger cattle and to engage more labourers at the time of weeding and gathering crops.

(*ii*) Often cultivators are ignorant as to what other crops their lands are capable of producing. Provision for thorough examination of soil and judicious selection of crops which take from the soil different kinds of plant food and dissemination of this knowledge to ordinary cultivators would ensure rotations and mixture of important crops.

QUESTION 13.—CROP PROTECTION, INTERNAL AND EXTERNAL.—(*i*) So far as I am aware, hardly any measures are known to cultivators for protection of crops for infectious diseases or pests.

(*ii*) It is highly desirable that such measures should be found out and widely made known to cultivators.

QUESTION 14.—IMPLEMENTS.—(*a*) Besides tractors and other highly costly foreign implements there is hardly any attempt to introduce any new implements nor are there any sort of implements known to cultivators which can be called better than those already in use. Encouragement in the shape of rewards and large orders from Government for newly invented useful implements.

(*b*) Demonstration of difference in the utility and greater advantage of new implements would greatly induce the cultivators to take to new ones. In the beginning it may be necessary to allow *sabat* lesser prices, the Government paying the difference.

QUESTION 15.—VETERINARY.—(*a*) The present arrangement is working well.

(*b*) (*i*) The dispensaries are under the local bodies. It cannot be said it is working well. They are under dual control and local bodies have scarcely sufficient funds to provide adequately for treatment of cattle. If Government be prepared to expend more for this department, it is better that the dispensaries should be under Government.

(*ii*) No, more and well-equipped dispensaries badly needed.

(*iii*) Yes, provided Government be prepared to expend adequate funds in the real work of providing more dispensaries with adequate supply of medicine.

(*c*) (*i*) No. The dispensaries should be provided within easy reach of the cultivators.

(*ii*) Not always. These are prejudices against inoculation and other scientific treatment though it is satisfactory to note that they are vanishing.

(*d*) There are no proper arrangements for segregation of diseased animals. Even such animals are allowed to graze in the common even after the disease has made considerable havoc in the flock. Yes, I strongly advocate legislation and wide publication of hand bills explaining the dangers of present mode of dealing with diseased animals and disposal of carcasses.

(*e*) Yes, in the mofussil away from railway or steamer stations it is very difficult to get serum just in time.

(*f*) The number of Veterinary Assistant Surgeons is inadequate. No fee is charged in the district of Pabna.

(*g*) Yes.

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QUESTION 16.—ANIMAL HUSBANDRY.—(*a*) (*i*) Breed of livestock may be improved by providing pasture grounds, better veterinary arrangements and by judicious selection of sires and by castrating the existing worthless sires and importing better variety of mates.

(*b*) (*i*) During the winter animals from different parts of the district are brought to common pasture lands without examining the animals, diseased animals spread contagion. Last year there was considerable havoc in such areas.

(*ii*) There is hardly any enclosed pasture in the Serajgunj sub-division where the land is very valuable.

(*iii*) This district being a jute growing area, fodders of all kinds are quite insufficient.

(*iv*) Yes, except in *bhil* areas where pulses are grown for grazing cattle, there is hardly any green fodder available during the dry season.

(*c*) Fodder shortage is marked from April to November. Nearly five or six weeks after November young growing cattle begin to thrive.

(*d*) By reserving public grounds and encouraging cultivation of fodder crops.

(*e*) By remission of land revenue and rents in proportion to the lands reserved for pasture.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(*a*) In this district cultivators work throughout the year. This being a jute growing district there is hardly any slack season. Whenever they are off agricultural work they generally prefer to repair their houses or do some subsidiary work, such as purchasing agricultural produce and selling in the nearest market.

(*b*) When crops are damaged by flood or some other reason the cultivators get leisure. The cultivators may be taught jute weaving, coir making, basket making, cane work, etc. The cultivators should be taught these manual works and should arrange for disposal of their produce and also be supplied to improve machines in hire purchase system.

(*c*) Bee-keeping is unknown in this district. Ordinary cultivators do to a certain extent poultry rearing in the crude way; the poorer section sells them but the well-off section does not do so. No instructions are imparted and no encouragements are given in the district in sericulture or lac culture. Holdings of ordinary cultivators are *ryoti* holdings and zamindars do not allow them to excavate tanks therein to rear fish. Law should be changed and the ryot should be allowed to excavate tanks and construct *pucca* houses which are essentially necessary for carrying on their business on improved method.

(*d*) Yes.

(*e*) Yes.

(*f*) Yes.

(*h*) They should be educated and the supreme value of good health should be impressed on them. By improving healthier condition of one or two villages the idea should be brought home to them and the possibility of better mode of living should be explained to them.

QUESTION 18.—AGRICULTURAL LABOUR.—(*a*) (*i*) and (*ii*) Steps should be taken to acquaint the unemployed labourers where they can find employment and facilities for journey by steamer and railway should be secured by allowing the concession rates. This is for seasonal unemployment for migration. It should be explained to people where ample lands would be available at what cost. They should be supplied with capital in the beginning and better right to the land should be secured to them.

(*b*) There is a shortage of agricultural labour in Bengal. If Santhals and upcountry labourers could be induced to settle in Bengal, this shortage would be removed. I think indigo industry was flourishing in this district. The planters imported many Santhals who were the ancestors of the *banias* in whose accent we notice Santhal tinge.

QUESTION 20.—MARKETING.—(*a*) No. There are no good roads or canals to good markets. Better roads and canals should be provided.

(*b*) No. The cultivators' produce has to pass through many middlemen who make their own profits and the shares of the producers are minimised. I refer to jute, rice, turmeric and *simul* cotton.

QUESTION 22.—CO-OPERATION.—(*a*) (*i*) By Government.

The Co-operative Societies' Act should be amended so as to limit the liability of the members of the agricultural societies. Liability of the members so far as the amount borrowed by him may be unlimited but their liability for contribution should be limited.

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to the shares held by them. Government should undertake to finance where private financiers are not forthcoming. The societies should be absolved from paying audit fees or at least these be considerably reduced. As explained above, the cultivators cannot fully understand the joint liability and they are often ruined for faults not their own. The members should be educated and the full extent of their liabilities should be explained.

(*ii*) By non-official agencies.

They should be encouraged by recognising their services and by rewards. Non-officials may do much by popularising the movement.

(*b*) Credit societies have done some good by reducing the rate of interest and by securing credit to people of smaller means. But when members fully realise the extent of liability they try to dissociate themselves as soon as they are in a position to pay off their individual dues.

(*ii*) Purchase societies have not generally succeeded in their object as most of the members lack in business habit and knowledge and owing to unsteadiness of markets which are under the control of people who have antagonistic interest.

(*iii*) Ditto as (*ii*).

(*iv*) These societies have not been largely tried or formed.

(*v*) Not yet formed owing to practical difficulty of getting people who would throw their plots in the hotch-potch.

(*vi*) None I know of.

(*c*) Legislation is necessary.

(*d*) I have personal knowledge of working of Central Banks and agricultural societies. They have secured some benefit to the rural population but owing to ignorance and illiteracy of ordinary cultivators they generally fall victim to designs of literate few who form the managing committee.

QUESTION 23.—GENERAL EDUCATION.—(*a*) (*i*) Meritorious sons of cultivators in some cases have succeeded in improving their own plots but in many cases they are useless burden on the other members of the family causing loss in agriculture.

(*ii*) and (*iii*) Number of educated among the cultivators, the young men receiving some education are quite unwilling to follow their ordinary avocation. I am of opinion that when most of the young men will be educated they will not feel hesitation in following their profession notwithstanding their education but such education will greatly help them in improving cultivation and adopting improved agriculture.

(*b*) Primary education should be free and compulsory and the syllabus should include agricultural subjects.

(*ii*) There should be arrangement for free or compulsory education in this Province.

(*iii*) The cultivators do not understand or appreciate the real object of education They think of securing service of some sort; that is the only objective. When they find no chance of securing such services they think it waste of money and time in sending their boys to school. Moreover such half educated young fellows become useless burden on the family.

QUESTION 24.—ATTRACTING CAPITAL.—(*a*) If steps be taken to minimise the risk to crops and better methods of cultivation.

(*b*) Agriculture under the present state of affairs is not at all attractive as it is subject to loss. The crops are liable to damage in many ways and price unsteady, being regulated by people who have no sympathy with agriculturists and Government being quite apathetic to effect any improvement or saving agriculturists from such loss. This year the price of jute cannot compensate the expenditure not to speak of any profit. Last year many labourers took to agriculture and this year many *bonâ fide* cultivators are thinking of selling off their lands owing to unusual difference in price of jute in these two years.

QUESTION 25.—WELFARE OF RURAL POPULATION.—(*a*) Health of mofussil should be improved by introducing sanitary measures by Government initiative, such as digging more tanks and wells, reclamation of waste lands, re-excavating or filling up old and unhealthy tanks. Legislation should be undertaken to compel the owners of insanitary tanks, jungle *dobus* and *bhils* to part with their interest or to pay the cost when improvement is effected by private individuals, local bodies or Government. The cultivators should be protected from the wily designs of unscrupulous moneylenders and the tenants should more secure interest in their holding, more free to excavate tanks, wells and erect *pucca* structures.

(*b*) Yes. Inquiry should be directed towards the profit and loss of the cultivators on a standard of healthy living.

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Oral Evidence

24157. *The Chairman :* Khan Bahadur Maulvi Wasimuddin Ahmed, you are Chairman of the District Board, Pabna ?—Yes.

24158. You have very kindly provided the Commission with a note of the evidence which you wish to give. Have you anything in general to say at this stage or shall we ask you questions ?—You may ask questions.

24159. I see you are interested in the problem of demonstration farms. Have you any personal experience of the demonstration farms ?—I have some experience of the farm at Pabna ; otherwise I have not got any detailed knowledge of their working.

24160. I am sure you realise that if it is proposed to illustrate the economic possibilities of a particular agricultural practice, then you must separate experiment entirely from demonstration ?—Yes.

24161. Do you not think that demonstration on the cultivator's own holding is probably the most effective method ?—Yes, I think so.

24162. I am a little surprised to see that on page 532 of your note you give it as your experience that labourers in the part of the country with which you are familiar are not honest workers and that they always try to cheat their employers. What form does that take ?—Unless there is supervision over them they will always spend their time in smoking, doing this and that and they work very slowly , so that the employer does not get sufficient return for the wages he pays.

24163. Is it impossible to devise any system of piece-work ?—For agricultural purpose it is not always possible. In some cases it may be possible and that is often done in the case of reaping paddy. In theory the labourer is to get one sheaf for every ten sheaves ; but that one sheaf will be equivalent to three sheaves so that in practice he takes about a third.

24164. They do not like the idea of payment by result ?—No ; they do not.

24165. You employ labour yourself ?—Yes.

24166. So that the alternative is to provide sufficient supervision ?—Yes. Of course, I engage some people for supervision, but I do not know whether they supervise properly because they also come from the same class as the labourers.

24167. On page 533 of your note, in answer to our Question 4, Administration, paragraph (*ii*), you say "No. Owing to abuses prevailing in these services none but the shrewd Marwaries and dealers venture to entrust their commodities with these officers." What services are you referring to there ?—I refer to the booking of goods and commodities.

24168. So, that refers to Question 4 (*c*) (*ii*), Railways and Steamers. Is that right ?—Yes, it refers to railways.

24169. You say " Their conduct with the public shows as if they do not get any pay from these departments but they are licensed to live on the gratifications offered by the dealers." Does that refer to the Railway Company's officers ?—Yes.

24170. It is your experience that the Railway Company's officers are corrupt, is it ?—I often notice that.

24171. *Rai Bahadur Bannerji :* What about the officers of the Steamer Companies ?—I say both railway and steamer services.

24172. *The Chairman :* On the same page of your note you say, "Abuses in the railway and steamer services may be removed by appointing better educated men in these services. It is an open secret that some semi-educated station masters make princely income besides getting large supply of food materials not only for themselves but for a large number of friends. They have also to share their profits with superior inspecting staff." Do you associate education with integrity in your experience of life ? Do you think that the fact that they are semi-educated is the cause of the malfeasance where it exists ?—I expect that the educated man would be more honest. He has ideas of self-respect and other things.

24173. He has a different view of life ?—Yes.

24174. On the same page again you are talking about advances to cultivators and the possibilities of meeting the financial requirements through co-operative credit societies, and you make the statement that there is a growing tendency not to join the co-operative societies. On what do you found your view when you say that ?—I have worked in the Co-operative Department since 1910 and I have got some experience in the district. I was the Managing Director of the biggest Central Bank in this Province, the Pabna Central Co-operative Bank. None but the people who verge on bankruptcy join the co-operative societies.

24175. Let us hear then exactly what your experience was. Did you begin with primary society first of all ?—I first tried to organise some societies.

24176. Did you succeed ?—Yes.

24177. Credit societies ?—Yes; I found that none but the people who had no credit would join the societies; they fought shy of taking the risk of unlimited liability. There is every chance of losing one's all for the fault of others.

24178. You suggest that the individual member's liability may be unlimited so far as his own debt is concerned. That is a fairly conservative form of liability ?—Whatever loan he takes he may be made responsible for the full amount of that; but he cannot be made liable to forfeit all the earnings of his life.

24179. Do you think you could build up a great system of co-operative credit on a scheme such as that ?—I think so.

24180. Have you anything to say about the Irrigation Department other than that which you set down in your note ? Have you any experience of its work ?—It did no work in my district. There was an Act of 1895 and it was on the Statute Book till 1920, that is, for 25 years. When I first went to the Council the first question that I put was whether any irrigation works were undertaken under that Act. I found that except for two or three areas very close to Calcutta no area was tackled and nothing was done. And ever since the enactment of this Bengal Agricultural and Sanitary Improvements Act, they have done very little work. I myself submitted proposals for several works and they have been put off from year to year without any sufficient reason. The tenants are suffering the most and they are willing to pay for the works, and if the District Boards were free to take up the work they would have been completed by this time. But under the rules the Government will have to be approached and their sanction is necessary. When we write to the Government they say that matters are pending with the Irrigation Department. I have been crying myself hoarse over the matter and I am writing letters every two or three months, but I get no satisfactory reply and the matter is hanging fire for more than three or four years.

24181. What are the requirements of your own district in the matter of irrigation ?—In my district irrigation on an extensive scale is not necessary; irrigation is only necessary in some districts. The strange thing is that the *bhil* area is covered with water during the rainy season but during the dry season it gets no water; some of the winter crops, such as wheat and barley require irrigation, they do not get sufficient water.

24182. Are there wells ?—They have no wells.

24183. If they had wells, do you think they would provide water ?—They would be small wells which would not supply any large quantity of water for a reasonably large area; they do not go to a lower depth than 25 or 30 feet.

24184. *Rai Bahadur Bannerji:* Then what system of irrigation would you propose for *bhil* areas ?—Canals to which the surplus waters could find access after the rains, so that sufficient water could be pumped up and kept and distributed for irrigation by pipes.

24185. *The Chairman:* On page 536 of your note, in answer to our Question 17 as to agricultural industries you say, "In this district cultivators work throughout the year. This being a jute growing district there is hardly any slack season." Have you made close enquiries before making that statement, because that is hardly in accord with evidence we have had from other witnesses ?—Yes.

24186. You are satisfied that there is no important slack season. When is the jute sown ?—In April.

24187. When is it reaped ?—In August and September.

24188. What attention does the jute require between April and August and September ?—Almost all the cultivators grow jute as well as paddy and other things. In April they are engaged in sowing; after two weeks they will have to weed again, and weeding will continue all through between April and August.

24189. Then we come to October; what happens in October ?—That is the retting season.

24190. That takes them to the end of October ?—Yes.

24191. What do they do in November ?—In November they begin to gather winter crops.

24192. What is the winter crop ?—*Aman* paddy; that is sown broadcast.

24193. That comes in during November ?—Yes.

24194. Is that all in by the end of November ?—Yes. In some areas it is all over; in the *bhil* area it continues to December.

24195. Does the cultivator as a rule have two classes of crop on his holding ?—Yes.

24196. What happens in December ?—In December, there are the early *rabi* crops; then they are engaged in sowing winter crops, and from December to February is the time when they are engaged in repairing their houses. That is a somewhat slack season.

24197. What happens in March ?—From the end of February they begin to prepare lands for the next crop, for jute as well as paddy.

24198. So that in your experience they have about two months to mend their houses and do other odd jobs ?—Yes, smaller works. In one year there was a failure of crops during the rainy season brought about by early flood, and I requested the Deputy Director of Industries to send out people to teach them gunny bag making. A party was sent, and they gave some illustrations, but ultimately the people did not take up that occupation, partly because they did not like it and partly because they had not sufficient money to purchase materials and machineries necessary for the purpose.

24199. Is there much malaria in your district ?—There is especially in the Sadar Sub-Division.

24200. Could you give the Commission any indication of the number of days in the year on the average the cultivator spends incapacitated by malaria ?—I have not thought about the matter.

24201. In one section of your evidence you mention the system known as *damdopat*; I should like from you a statement of what that system comprises ?—That system is a Hindu law; it was formerly in use during the Hindu times; even now in the Presidency towns of Bombay and Calcutta that law is in vogue. It says that no court shall pass a decree for any amount as interest more than the principal.

24202. That is to say, when the interest paid equals the principal borrowed, nothing remains to be paid but the first principal; is that right ?—No, the parties between themselves may pay anything, but when the matter comes before the court, the court should not pass a decree for interest more than the principal. The reason is that a small sum may be borrowed and allowed to accumulate with interest, and subsequently in five or six years the lender comes to court and obtains a decree for a very large amount which crushes the borrower.

24203. On page 533, in answer to our Question 6 (*b*), you say the law of *damdopat* should be enforced. Is it in fact a law ?—Of course I use the term very widely; I think that is a law in practice in the Presidency towns of Calcutta and Bombay, and it may be extended.

24204. Is it a statute law ?—No.

24205. *Dr. Hyder:* Is it part of the customary law ?—Yes.

24206. It is the rule of *damdopat* embodied in the customs of the country ?—That was in practice during Hindu period.

24207. *Sir Thomas Middleton:* You criticise the demonstration farms; you think there ought to be more of them and they ought to be less costly. Have you demonstration farms in your own district ?—Yes, I have one.

24208. What is it that you complain of chiefly ?—My complaint is not with the working; my complaint is that it is intended to illustrate to the people something they can follow up, but we find that a highly paid officer is maintained there for supervision and some labourers are employed at a very high cost; no doubt the buffaloes and bullocks that are kept are well fed, but it is at a very exorbitant cost, and when you compare the cost with what the producer gets in return, it is not sufficient to warrant such expenditure, and it does not encourage the cultivator to take it up.

24209. But on page 532 of your note you say, "In some demonstration farms new varieties of crops have been introduced successfully, such as cultivation of *Chinsura green* jute which gives larger profits to cultivators" ?—Yes, it does.

24210. Has not that improvement been introduced as a result of maintaining these costly farms ?—Yes. Of course I do not complain of expenditure being incurred for demonstration purposes simply and for research, but that expenditure would not do for the ordinary cultivator.

24211. But you cannot get something for nothing, and unless you maintain the farm there will be nothing for the cultivator to benefit by ?—Yes, from that point of view it may be justified.

24212. For example, how would you have got your *Chinsura green* jute if you had not had the farm ?—But it could be done in a single farm in the Province ; it is not necessary that in every district there should be such a farm for demonstration ; these things could be done at the Dacca farm and the seed distributed when its success had been proved. It is not necessary that it should be demonstrated at every district farm.

24213. If the study of the needs of Bengal were confined to the Dacca farm, do you think you would get useful modifications in practice introduced in the other districts ?—It would be sufficient for a great part of Bengal.

24214. *Dr. Hyder :* Is much land passing out of the hands of cultivators in Eastern Bengal ?—Yes.

24215. You would like to have a law in Bengal similar to the Punjab Land Alienation Act ?—Yes, exactly.

24216. You think that is necessary ?—All the land of the cultivator should not be made saleable. There is a law providing that the implements of artisans, etc., cannot be sold ; the ordinary cultivator's homestead cannot be sold ; but the homestead is not sufficient ; some land alongside the homestead should be prohibited from being sold. I found in one district that more than 70 per cent. of the land had gone into the hands of *sowcars*, and the ryots who were holding immediately under the landlord have become wage labourers.

24217. Do you find that about 90 per cent. of the civil litigation in Eastern Bengal centres round indebtedness and rents ?—I should think that 80 per cent. of suits centre round these two subjects.

24218. Have you any criticism to make as regards the present policy of increasing primary education among the cultivators of Bengal ?—Primary education should be imparted to the cultivators.

24219. You think the cultivator is getting back in the form of beneficial services, such as education, a portion of the taxes he is paying ?—A portion of the tax. Of course, if primary education cannot be imparted without taxation, we should pay the tax.

24220. What do you think of the *maktab* schools ?—They are nothing but primary schools teaching a little reading of the Koran.

24221. *Professor Gangulee :* Are you connected with the co-operative movement now ?—Yes. I am one of the Directors of the Central Co-operative Bank. I am also an organiser of societies in the district. With regard to the latter I do very little work, having lost much of my energy.

24222. You say that the system is getting unpopular. Why ?—Because of the fault of others many innocent people have had to suffer and during the liquidation process they had also to suffer very much.

24223. Whose fault was that ?—The fault was of course theirs.

24224. But you say the system is unpopular ?—Because there is the law that in the case of agricultural societies the liability should be unlimited. In that case if a man takes on unlimited liability he has a chance of losing all his properties, just through the fault of others.

24225. What steps would you yourself take to stop this ?—Of course we try to impress on the people that the entire money belongs to them and that they are responsible for the entire amount. We also impress upon them at the time of distribution to see that undesirable people should not be given any money, and also that they should be very vigilant in their activities to get back as much money as they could from the members whenever there was money to spare. Notwithstanding all these things, principally because they are uneducated, they have no foresight. They do not understand the ultimate liability they have to run, and for all these things they care very little. They entirely depend on panchayats, on which bodies there are always one or two educated men who usurp the entire functions. These panchayats are seldom called and everything is done by these one or two educated men. It so happens that the secretaries and the chairmen of these bodies are the worst defaulters, so that for their fault the innocent people have got to suffer.

24226. You were at one time Managing Director ?—Yes.

24227. During your tenure of office as Managing Director what steps did you take to stop these abuses which crept into the societies ?—At that time we had also to instruct our supervisors to the effect that the pancha at should not get any loans without the special sanction of the Central Bank, and we wanted to have a safeguard in that way, but it failed. We found that loans were advanced *benâmi*, and whenever the borrower was approached he said that he did not take the money but that the money was taken by the

Secretary who had simply asked him to put his signature which he did. These people were uneducated and did not understand the responsibility of putting their thumb impression on the paper and thereby having their necks put into a halter. Therefore all their endeavours in that direction failed.

24228. So that you put the blame on the educated people ?—I said in my answer that the ignorance of the many and the literacy of a few are really responsible for these things.

24229. Do you mean to suggest that the educated man may be legally honest but morally dishonest ?—In these villages you do not really get any educated men. They know only how to read and write and they can only read printed matter.

24230. You are the Chairman of the District Board ?—Yes.

24231. What is the crying need of your district ?—The crying needs are good roads, sanitary measures, primary education.

24232. With regard to primary education, what are your views ?—To have free and compulsory education.

24233. Would you be prepared to pay an extra cess ?—The principal thing that we want is education, and for that purpose if the Government be in a position to give it to us without any taxation that would be very desirable and it would also be very popular, but if the Government could not do it without taxation, I would not hesitate to go to the length of getting the education by paying a tax.

24234. *The Chairman :* How many primary societies were you familiar with ?—Nearly 250.

24235. And is this experience of yours (namely, illiterate members being taken advantage of by the more literate individuals) based on experience gained in most of those societies ?—Yes.

24236. Or are you thinking of any one particular society ?—No, it is widespread. There are a few exceptions no doubt, but these could not be more than 5 per cent.

24237. So that you think that 95 per cent of these societies are improperly managed ?—Yes.

24238. *Professor Gangulee :* And at any time did you bring this matter of mismanagement to the notice of the Registrar of Co-operative Societies ?—Yes, and I think this is a fact which is known to everybody. You will find it mentioned even in the annual reports of the Registrar.

24239. *Rai Bahadur Bannerji :* Is there not a very great demand for these societies and is it not a fact that the Registrar cannot cope with the registration as he has been receiving such a flood of applications ?—The number of bankrupts is large.

24240. *Professor Gangulee :* What steps did you take to educate these primary societies ?—We distributed some money from our Central Bank savings towards starting night schools and giving individual help.

24241. These abuses you refer to could not exist, you say, if they had had the real public support of the educated people and the District Boards behind them ?—The District Boards had nothing to do with them.

24242. But at present the educated people must be taken to be men belonging to the District Boards ?—In the District Boards there are only eighteen to twenty members.

24243. *Mr. Calvert :* Would you, as Director of a Central Bank, prefer to lend money to the society with a limited liability or would you lend it to the society with an unlimited liability ?—We have lent money to both kinds of societies, but in the case of agricultural societies we would prefer an unlimited liability society, as a creditor.

24244. With unlimited liabilities there are certain advantages ?—Certainly, but that advantage is for the creditors and not for the members of the primary societies, the debtors.

24245. Do you believe that unlimited liability has any educative effect on the members ?—In most cases they do not understand the real extent of the liability they undertake by being members of unlimited societies. If they were to understand it I do not think that they would become members.

24246. This is the unlimited liability to which you are taking exception. Is not that the general rule of all life throughout Bengal ?—Only in the case of co-operative societies.

24247. Except for banks and co-operative societies are not all transactions based on unlimited liability ?—In most cases.

24248. And a limited liability in this country is a comparatively modern thing ?—I do not quite follow you.

24249. Limited liability was only introduced into India about sixty years ago ?—It may be so, but in the case of an ordinary cultivator he has no experience of unlimited liabilities. He executes bonds in favour of *mahajans* and he understands that he is responsible to the *mahajan*. It is only when the society goes into liquidation that unlimited liabilities become known to the ordinary cultivator.

24250. There are defects in the teaching of the members, I suppose ?—Yes, and they are not quite prepared to understand what these defects are.

24251. *Dr. Hyder :* With regard to the application of the Usurious Loans Act, you say this Act is not enforced because the judicial officers have sympathy with the creditors ? —Yes. I found this to be the case frequently.

24252. What would you suggest to overcome this defect ?—There should be a hard and fast rule to the effect that, beyond a certain percentage of interest, nothing should be allowed, and the Courts should be tied down. In that case the Courts hands would be tied down to giving a decree for nothing more than the principal.

(The witness withdrew.)

The Commission then adjourned till 10 a.m. on Friday, the 7th January, 1927.

Friday, January 7th, 1927

DACCA

PRESENT :

The MARQUESS OF LINLITHGOW, D.L. (*Chairman*)

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S.
Sir THOMAS MIDDLETON, K.B.E., C.B.
Sir JAMES MACKENNA, KT., C.I.E., I.C.S.
Mr. H. CALVERT, C.I.E., I.C.S
Professor N. GANGULEE.
Dr. L. K. HYDER.

Rai A. C. BANNERJI Bahadur (*Co-opted Member*).

Mr. J. A. MADAN, I.C.S.
Mr. F. W. H. SMITH } (*Joint Secretaries*).

Mr. S. N. ROY, a Member of a Deputation of Representatives from certain districts in Bengal

Oral Evidence

24253. *The Chairman :* Mr. Roy, I understand you are a cultivator in this Presidency ?—Yes.

24254. From what district do you come ?—I come from Burdwan.

24255. We are glad to take the opportunity of your visit to Dacca in connection with the Agricultural Exhibition to hear some of your views in these important matters. What, in your view, are the principal difficulties with which the cultivator in your district is at present faced ?—The chief difficulties are malaria and the want of irrigation.

24256. Do you connect those two things in your mind ?—Yes.

24257. Because with good irrigation you get good drainage; is that the point ?—Yes.

24258. How many days in the year does the cultivator in your district as a rule find himself incapacitated by malaria ?—From September to March.

24259. Is it a common thing for men to be unfit for hard work during the whole of that period ?—Yes.

24260. Has malaria grown worse, that is to say, has the incidence of malaria risen in your experience ?—Yes, very highly.

24261. Do you think there is more malaria amongst the population that you know now than there was when you were a boy ?—Yes.

24262. To what do you attribute that ?—It is due to the embankment of the Damodar canals and high roads.

24263. Do you think it is all a question of interference with the drainage ?—Yes.

24264. What are the main crops in your district ?—Paddy, sugarcane, potato and pulses are the main crops.

24265. There is no jute ?—There is very little jute. We have avoided this crop because it increases malaria.

24266. The jute increases malaria ?—Yes, because we have not got any river in our district. We have only stagnant ponds and these increase malaria.

24267. Do you get more than one crop off the land in the year ?—Not in the case of all crops. We get only one crop in the case of winter paddy; we get only one crop of sugarcane; we get two crops of potato and also of pulses.

24268. Do you grow potatoes in rotation with other crops ?—Yes.

24269. What is the ordinary rotation ?—Pulses and hemp. As soon as we cut the pulses we plant potatoes, and then in that land we plant autumn paddy.

24270. That is the third crop ?—Yes. We get two crops in the year.

24271. Are you satisfied with the yield of the paddy ?—No.

24272. Have you any knowledge of the varieties of paddy at present being recommended by the Agricultural Department ?—Not at all. We are not in touch with that department. We do not know even whether that department exists. Of course, we know something about it from the newspapers. In fact, this is the first time that I have come in contact with that department.

24273. You have been round the Exhibition ?—Yes, and I have had very sad experience of it.

24274. You had a sad experience at the Exhibition ?—Yes, and also very sad experience of the help that we get from the officers there.

24275. What has been your experience ?—No one can explain the matter thoroughly.

24276. Just tell us about that, will you ?—I am very much interested in paddy. I went to the paddy stall and the officer in charge could not explain to me the nature of the soil from which that particular paddy was produced. I wanted to know its outturn per *bigha*, the manure used and various other things, but he told me nothing.

24277. You did not get the exact advice that you sought ?—Yes, and this was the case with most of the stalls. I am, for instance, interested in the growing of tobacco in my place, but I did not get any suitable reply from the man in charge of the tobacco stall.

24278. You mean to say that at the Exhibition itself you did not get the advice that you sought ?—Yes. I could not even get the opportunity of going to the farm. We are all here to roam about.

24279 *Professor Gangulee:* But there is a farm in Burdwan ?—We do not know it; we do not even know of the existence of it.

24280. How far do you stay from Burdwan ? What is your village ?—My village is Panchara; it is half an hour's journey from Burdwan.

24281. And yet you do not know of the existence of the Burdwan farm ?—No.

24282. *The Chairman :* Have you ever been visited on your farm by an officer representing the Agricultural Department ?—Never.

24283. Has there been no propaganda or demonstration in your neighbourhood ?—Never.

24284. What is your view as to the service which science might be able to render to you and neighbouring cultivators ? Do you think there are things which could be put before you which would be of use to you ? Have you confidence in the possibility of applying science to practice ?—Yes, a good deal.

24285. Do you think that the time has come when the experience of cultivators in other countries and all that science has to teach ought to be made available for you ?—Yes.

24286. And you are anxious to learn ?—Yes.

24287. Do you think yourself that there is much unreasonable conservatism amongst cultivators ?—Yes.

24288. I want you to understand the question. Do you think yourself that cultivators are too conservative or do you think that cultivators are ready to adopt new methods ?—They will adopt new methods if they are convinced by practical demonstration. They will adopt only that method which they have seen to be successful with their own eyes; otherwise they will not adopt it.

24289. What, do you think, is the best form of demonstration ? Demonstration on a plot of land managed entirely by the Agricultural Department or demonstration on a cultivator's own holding, arranged in conjunction with the department ?—My own idea is that the experiments should be carried on in Government farms.

24290. The experiments should be carried on in Government farms ?—Yes, and if they are successful, they should be brought to the villagers' notice. There are educated cultivators in villages who are eager to adopt new and improved methods. If these officers approach them and give them their advice and help, they will be very glad to have that experiment demonstrated in their fields.

24291. It is a more convincing experience to see the crops or methods tried on the cultivator's own holding ?—Yes.

24292. Because, there you have conditions, both as regards the size of the holding and the nature of the soil and the practice of agriculture, with which you are thoroughly familiar ?—Yes, and that is the best form of agricultural education, as far as I understand.

24293. Have you anything to say a out indebtedness ?—A good deal.

24294. Is there a co-operative society in your district ?—Yes.

24295. Are you a member of it ?—No.

24296. Why not ?—I have not been approached. My father was once a member of the co-operative society, but he got disgusted with it.

24297. He did not like it ?—No.

24298. Why not ?—Because it did no good to the cultivators.

24299. Do you mean that they could not borrow money any more cheaply from the society than they could from the *sowcar* ?—Yes, the rate of interest is very high.

24300. Is it your suggestion that the rate of interest was as high from the society as it was from the moneylender ?—Yes, in our part of the district.

24301. At what rate can you borrow from a moneylender ?—12 per cent.

24302. That is, if your credit is good ?—Yes.

24303. At what rate does the local co-operative credit society lend ?—At 12½ per cent.

24304. The rate is ½ per cent. higher than the rate charged by the local moneylender ?—Yes.

24305. How long has the society been at work ?—For a long time.

24306. How do you account for the fact that the society exists if it lends money at a rate which is ½ per cent. higher than the local moneylender's rate ? Surely, nobody would go to the society ?—They lend money to the townpeople.

24307. Have you a local town ?—Yes, Burdwan.

24308. Does your local credit society lend money to townsmen ?—Yes.

24309. What for ?—For building purposes, or things of that sort. We have no opportunity of finding out any transactions done in the village by this society.

24310. You know very little about the society ?—Yes.

24311. Has there ever been any propaganda in favour of co-operative credit societies ?—No.

24312. Nothing of that sort ?—In name only. We heard that our Union Board was approached by letter to open up a co-operative credit society in our village. We have got an anti-malarial society.

24313. How is that working ?—Quite well.

24314. *Rai Bahadur Bannerji :* It is a co-operative anti-malarial society ?—Yes.

24315. *Professor Gangulee :* Are you a member of that society ?—Yes, and I take a good deal of interest in it.

24316. *The Chairman :* Have you a local Union ?—Yes.

24317. Does the anti-malarial society work in conjunction with the local Union ?—Yes.

24318. Does the moneylender who according to your evidence lends at 12 per cent., claim exact and regular payment ?—No. He wants to have it accumulated to get compound interest and to get hold of the holdings. That is the case with the people who have got holdings. From the ordinary cultivators who have got no holding and who are merely labourers, he gets his interest yearly in paddy.

24319. Are the holdings very small ?.—Yes.

24320. Are they fragmented ?—Yes.

24321. Has there ever been any idea in the village of attempting to consolidate the holdings, so that each man might get as large a bit of homogeneous land to cultivate as possible ?—No; but nowadays it has become the practice, especially amongst the educated classes, when any division is being made amongst the sons or the heirs, not to divide each plot but to divide it by valuation.

24322. So as to try and keep the land together as much as possible ?—Yes; several people in our village have done it.

24323. Whose idea was that ?—That was my idea.

24324. Have you found any difficulty in carrying that out ?—No.

24325. Have you found any difficulty in connection with the original tenure holders ? You make the arrangement, as I understand it, in this way, that instead of dividing the holding you satisfy the younger sons in money ; is that the idea ?—No.

24326. Will you explain what is the procedure ?—If there are several plots of land, one of 2 *bighas*, another of 2 *bighas*, and another of another size, instead of dividing each plot of land we make a valuation of the plots and divide the plots.

24327. You do have sub-division but without fragmentation ?—Yes. The zamindars are in our way ; they charge too much.

24328. *Rai Bahadur Bannerji :* As commutation fee ?—Yes ; it is 6 annas.

24329. Per rupee of the price of the land ?—Yes.

24330. *Sir Henry Lawrence :* What is that charge for ?—They charge 6 annas out of 16 annas ; if it is Rs. 100, they will charge about Rs. 30.

24331. For what purpose ?—The landlord charges it for the transfer of the land.

24332. *The Chairman :* At the time when the father dies and the sons share the property, this commutation fee is levied by the zamindars ?—Yes. But there is a difference in the case of transfer and in the case of hereditary right.

24333. What is the difference ?—They charge too much for transfer.

24334. *Dr. Hyder :* How much do they charge for succession ?—It varies according to the wish of the zamindar.

24335. What is your idea of it ?—Some charge Rs. 2 per Rs. 100, some Rs. 10 per Rs. 100, and some charge 4 annas in the rupee of the rent.

24336. *The Chairman :* Where do you get your plough bullocks from ?—Locally.

24337. Have you sufficient fodder to feed these animals throughout the whole year as they should be fed ?—No.

24338. At what seasons of the year does the shortage occur ?—There is a shortage throughout the year.

24339. Is there not a season of particular shortage ?—It is at this time of the year.

24340. Does anybody in your neighbourhood grow fodder crops for their cattle ?—No ; they have only paddy straw.

24341. Did you see any of the fodder crops exhibited at the Exhibition ?—No.

24342. Do you think that cultivators would be willing to grow a certain amount of fodder crops at the sacrifice of a certain amount of food or money crops ?—Yes, they are ready. For winter paddy, we can grow only one crop ; after harvesting the winter crop there is one crop of *kosali* pulse which is very good fodder for the cattle in our district, but for want of irrigation and moisture that fodder cannot be grown.

24343. Would it be possible to grow that fodder on land on which paddy had been grown ?—Yes.

24344. I am thinking of the danger of breaking the soil pan. Could you grow that fodder ? Would not deep ploughing interfere with the existing soil pan, so that it would not hold water for the next year's paddy ?—The crop that I am speaking of, *kosali* pulse, is only spread.

24345. It does not involve ploughing at all ?—There is no ploughing at all.

24346. You could grow it without in any way spoiling the land for paddy growing next year ?—Yes.

24347. What you want is water ?—Water, and at the same time there should be no malaria ; that has affected our labour supply, and there is the labour difficulty.

24348. Do you and your neighbours consume any dairy produce yourselves ? Do you get any *ghi* or milk ?—We have not got any dairy, but we have our cattle ; milk is very scarce ; it is very difficult to get it.

24349. Do you realise how important it is for health that one should have some of these things in one's diet ?—Yes, certainly.

24350. I expect you realise that people who do not eat meat require milk and *ghi* even more than people whose diet does contain meat ?—Yes ; in our villages the cultivators seldom get meat ; they live on fish, vegetables, *ghi* and milk. I am a vegetarian, but I find great difficulty in getting pure *ghi*. Whatever *ghi* we get in the bazaar is adulterated ; in fact, every article of food is adulterated and it is very difficult to get anything pure.

24351. Have you got any milch cattle yourself ?—Yes.

24352. Do you get milk from them ?—Yes.

24353. Do you consume that milk ?—Yes.

24354. Do you make any *ghi* or butter ?—Very little. The milk supply is deteriorating; in our boyhood cattle were giving milk to the extent of 6 to 7 seers, that is about 12 to 14 lbs., but nowadays, it is very difficult to get a cow giving even 4 to 5 lbs. of milk.

24355. That may be due to the cow being of a bad milking family. May it not also be due to the fact that the cow does not get enough food ?—We do give it enough food; it is due to deterioration of the animals. We do not also get pasture lands; all the pasture lands have been usurped by the zamindars.

24356. But even pasture land does not help in the season of shortage, unless there is irrigation ?—It will help in winter and in June.

24357. There is very little grass in those seasons in the pasture lands ?—Yes.

24358. In your village, are there many days in the year in which the cultivator has little to do ?—There are.

24359. How does he employ his time during those days ?—He whiles away his time; he has not got any occupation.

24360. What is your own view about the possibility of introducing village industries ? Do you think it might be done and might be useful ?—It might be useful.

24361. Have you yourself any experience of any spare-time occupation of any sort ?—Yes. We grow cotton and make cloth, also we grow hemp and jute and from jute we make thread and ropes.

24362. But there are no spare-time occupations in existence at the moment ?—No, there are none.

24363. So that when a man has mended his roof and perhaps cleaned out his tank, that is all he has to do ?—They seldom clean the tanks.

24364. After he has mended his roof and patched his house up he has a great deal of spare time on his hands ?—Yes.

24365. Is there a school near your village ?—In the village we have a middle English school.

24366. And how about the primary schools ?—That is the only school we have got.

24367. The cultivators in your district believe in education for their sons ?—Some do.

24368. Half or less than half ?—More than half.

24369. Do you think that more cultivators believe in education for their sons now than was the case when you first remember ?—Yes.

24370. Education is more popular than it used to be ?—Yes.

24371. What do you think of the education given in your local school ?—That is not at all satisfactory.

24372. What is the matter with it ?—We have not got good teachers; we cannot afford to pay good teachers.

24373. Do you happen to know how much your teachers are getting ?—Yes; the headmaster gets Rs. 25 a month; the head *pundit* gets Rs. 15.

24374. How many masters are there ?—Five.

24375. What does the junior master get ?—Rs. 5.

24376. Rs. 25 and 5 are the figures ?—Yes. Our school is one of the best in the district.

24377. And the children go straight from their homes to this school ?—Yes.

24378. They do not pass through any primary school ?—No; we have got arrangements for educating small children also in that school.

24379. *Professor Gangulee :* And these teachers belong to the village ?—Some do.

24380. *Dr. Hyder :* Have they got other sources of income ?—Besides getting pay from the school they have got other income; they have lands.

24381. And you like the system ?—Yes.

24382. *Sir Henry Lawrence :* Who pays the salaries ?—They are paid out of subscriptions from local people and from students' fees; we also get some aid from the District Board.

24383. You get no grant from the Government ?—We get a grant only from the District Board, not from the Government.

24384. *Rai Bahadur Bannerji:* What is the grant from the District Board ?—Rs. 20 a month ; that is the highest that could be given.

24385. *The Chairman:* Would you mind telling me how much land you yourself cultivate ?—I cultivate 50 acres.

24386. Is that one of the biggest holdings in the neighbourhood ?—It is not in one plot ; it is scattered.

24387. In how many different plots ?—More than 100 plots.

24388. And you cultivate all the 100 plots ?—Yes ; I do.

24389. Then you must be spending all your time in walking from plot to plot ?—I work from 5 in the morning till 10 at night.

24390. You realise what a disadvantage fragmentation is, do you not ?—Yes.

24391. You know how much more valuable your time would be if you could go on to your farm and work on it all day without ever having to step off your own land ?—Yes.

24392. Is it impossible for you to achieve, by arrangement with your neighbours, any further degree of consolidation ?—I had a talk recently with some of the villagers on the possibility of working on a co-operative basis ; but I do not know whether I will be successful in carrying out the work.

24393. It is very important that we should understand the position, because you have actual experience. Is the land on which all your various plots are situated of equal value, of equal quality ?—All the plots are not of equal quality, but most of them.

24394. What is the great difficulty now in achieving this consolidation ?—It is a new idea and our cultivators are very conservative.

24395. Do you think there is some hope that you may succeed ?—If education spreads, we may succeed.

24396. You associate the spread of education with the achievement of consolidation and with many other progressive improvements ?—Yes.

24397. Does the small farmer consume his own paddy or does he as a rule market it and purchase from the bazaar for his own consumption ?—In our place they do not purchase from the bazaar as long as they have paddy.

24398. They keep their own paddy ?—Yes.

24399. Where do you sell your paddy ?—There are merchants who come to our village and they take it to the railway station ; and there are *haulatdars* who send it to Calcutta and other places.

24400. How do you know whether you are getting a fair price from the merchant ?—We go and enquire.

24401. He comes to you as a merchant ; he does not sell on commission ?—No. We know the price prevailing in the market. Our village has very exceptional advantages ; we have got very good roads ; but there are villages where there is no road communication and there is great difficulty there ; they cannot send their produce at all in the rainy season ; they can send it only in the dry season.

24402. And do they get as good a price in those villages as you get ?—No.

24403. They are more or less at the mercy of the man who comes and buys in the village ?—Yes. Moreover these small cultivators take advances from the big men, or from the *sowcars* of the village.

24404. How far away is the agricultural farm, which you have referred to, from your village ?—Half an hour's journey by train.

24405. I am surprised that a man who pays so much attention to these matters as you evidently do should not have gone that half an hour's journey in order to see the farm. I am sure there must be some reason why you have not done that ?—I did not know that there was a farm.

24406. When did you discover it ?—Only some two months ago.

24407. How ?—I used to buy nitrate of soda and sulphate of ammonia from Messrs. Shaw Wallace and Co. and the Chilean Nitrate Committee. They have a branch in Dacca. One day they told me that they were supplying these manures to the farm here. Then I went to the office in the compound of the Government building and there I found a sign board hanging. I went inside but I could not find the officer ; I was told that he was on tour.

24408. *Rai Bahadur Bannerji :* You were told that the District Agricultural Officer was on tour ?—Yes. Afterwards a friend of mine might have told the officer about me because, one day when I went to Burdwan, he sent for me and had a talk with me.

24409. *Sir James MacKenna :* How long have you lived in Burdwan ?—From my boyhood.

24410. You told the Chairman that you were an actual cultivator and that you spent 17 hours a day in the pursuit of your agricultural operations. To what extent do you actually cultivate yourself ?—I have got my labourers and servants to do the work.

24411. These 17 hours you spend in supervision ?—Yes.

24412. You do not sub-let any of your land ?—I do.

24413. How much do you sub-let ?—I do not sub-let on rent but on division of paddy.

24414. Half and half ?—Yes.

24415. Do you spend all the 17 hours on agriculture or have you any other occupation ?—No other occupation at present.

24416. Might I ask where you were educated, because I see you have a very good command of English ?—My school education was in Midnapur.

24417. Did you take a University course ?—Yes, up to the F.A.

24418. I was surprised when you told the Chairman that you had not been cognisant of this Burdwan farm which was started in 1887 and which is one of the oldest farms in India ?—It might be.

24419. How many cultivators do you think there are in Bengal ?—90 per cent. are cultivators.

24420. How many members of the Agricultural Department ?—I do not know, not many.

24421. Would it not be easier perhaps for you to go to them than for them to try to find you out in your remote village ?—We have only one officer in our district.

24422. Do you know about his existence ?—I have come to know about it.

24423. Quite recently ?—Quite recently.

24424. I suppose the fact is that you are so busy in your own village that you do not go out of it ?—No, I go to Burdwan very frequently.

24425. Then I must express my surprise. But now you have got in touch with them, I suppose you are going to make use of their help ?—Yes, certainly.

24426. *Professor Gangulee :* How much of your 150 *bighas* do you farm yourself ?—With my own hands ?

24427. No, I mean under your direct supervision ?—Most of it I cultivate myself.

24428. Now, I want to know how much of it is given over on the half anna crop basis ?—Very little.

24429. Fifty *bighas* ?—About that.

24430. About one-third. What is the exact basis ? Is it the half anna basis ?—Yes.

24431. Is most of your crop paddy ?—Yes.

24432. I also must express my surprise that you did not know of the existence of Burdwan farm. You have told the Chairman that you are interested in adopting improved methods of agriculture, and you say you have come to know about this Department of Agriculture through newspapers ?—Yes.

24433. I take it that you do read newspapers ?—Yes, I do.

24434. What newspapers do you read ?—I read the "*Statesman*," "*Forward*" and "*Telegraph*" ; I am a regular subscriber to "*Forward*".

24435. And you have never noticed that Burdwan farm mentioned in any of those newspapers ?—Never.

24436. You certainly knew of the existence of an Agricultural Department ?—Yes.

24437. Have you at any time written to the Department of Agriculture for information ?—I did not actually do it but my father once when he was a member of the co-operative society got seeds from the Agricultural Department ; but our experience was very sad ; it was a total failure, and from that we lost our faith in that department and did not care to deal with it.

24438. You say you use the artificial manures, sulphate of ammonia and nitrate of soda; in that connection you never thought it necessary to ask the Agricultural Department for any information?—No, the representatives gave us it.

24439. The representatives of Messrs. Shaw Wallace and Company and the Chilean Nitrate Committee?—Yes.

24440. Do you take part in teaching at the village school?—No.

24441. You yourself are an educated man in the village, but you do not care to take part in teaching of your village boys?—No.

24442. Do the teachers in the middle school often come and see you?—Yes, we occasionally meet.

24443. What is the attitude of the landlords towards the question of consolidation of holdings? Who is your landlord?—We have got several landlords and there are the zamindars.

24444. Can you tell us the attitude of these men towards the problem of consolidation?—They are against it.

24445. Did you ascertain the reason for their opposition?—We cannot approach them.

24446. Have you Union Boards in your district?—Yes.

24447. Are you a member?—No, I am not a member; my father is a member.

24448. Do you think the Union Boards are popular?—To a certain extent they are popular and to a certain extent they are unpopular.

24449. Would you tell the Commission your views with regard to Union Boards?—I can speak of the Union Board of our village Union. These Union Boards are run more or less by one individual, the President; the other members more or less do as he directs. If the headman is honest and takes an interest, the Union works satisfactorily; otherwise it does not.

24450. Are you satisfied in your own mind that Union Boards could be made very effective rural organisations?—Yes.

24451. Under proper guidance?—Yes.

24452. Who elects the Chairman of the Union Board?—The President is elected by the Government.

24453. And the Secretary?—The Secretary is a paid man.

24454. Do you know how much he gets?—Rs. 15 a month.

24455. Do you know what his duties are?—To collect rates, to keep accounts and to look into the papers.

24456. Could you give us an idea of the income of your Union Board?—I cannot say exactly, but the rates collected will be about Rs. 1,400.

24457. Could you give us an idea of the area of this Union Board?—We have got five villages, about 4 or 5 miles long and 2 or 3 miles in breadth.

24458. Rs. 1,400 for five villages?—Yes.

24459. You are an educated man in that village; is there any other educated man in the village?—There are several.

24460. Do they stay in the village?—Some stay and some do not.

24461. You stay in the village?—Yes.

24462. Throughout the year?—Not throughout the year but most of the year.

24463. I want to get from you your relations with the cultivators of your neighbourhood?—I mix with them very freely.

24464. In what way do you mix with them?—I give them advice; I work with them. If possible, I lend them my seeds.

24465. Do you lend money?—Not much.

24466. You do lend some?—No, not at interest or anything of that kind; only to friends.

24467. You lend money as a friend. You say you give them advice?—Yes.

24468. Advice on what?—On production, of course, and cultivation; I try my best to give them any help.

24469. Do you have these meetings regularly or spasmodically?—I mix with them very freely.

24470. *Mr. Calvert:* You have told the Chairman that you grow potatoes and a certain amount of pulses. Do you also grow vegetables ?—Yes.

24471. And fruits ?—Not fruits.

24472. We have heard a great deal about the deficiency in the diet of the rural population of Bengal; could you say whether the consumption of potatoes, vegetables and pulses is increasing ?—Pulses are decreasing while potatoes are increasing.

24473. And vegetables ?—Last year we had a great scarcity of vegetables for want of water, but at present we have got good vegetables.

24474. Are English vegetables like cauliflower and cabbage being grown there now ?—Yes, I grow them.

24475. So that there really is a slight change in the diet of the people ?—Yes.

24476. Assuming that funds were available, is there any improvement of your land which you would like to carry out ?—Yes.

24477. What would you do if funds were available ?—If funds were available, I should grow vegetables in certain fields, use manures and keep good bullocks.

24478. Is there any improvement in the land itself which you would like to carry out, such as sinking wells ?—No, that would be no good in our part of the village; we want canal water. I want to grow potatoes and sugarcane, but for that we require irrigation from tanks.

24479. Or wells ?—No, in our part of the Province we require water from tanks.

24480. *Professor Gangulee:* How do you lift the water, by pump ?—No, there are other means. There are tanks just at the outskirts of the villages, and around these tanks potatoes and sugarcane are grown. These tanks belong to the villagers; there are certain lands adjoining the tank to which from time immemorial irrigation has been done from the tank. The proprietor of the tank will not give any water from that tank outside that limited area, so that if anyone wants to grow potatoes or sugarcane, he cannot do it for want of water, and for the supply of water for irrigation the proprietor cannot get anything.

24481. *Rai Bahadur Bannerji:* But can the cultivators not make their own tanks on the land ?—They have only got about one *bigha* of land and there is no space to make any tank. These tanks are now being silted up. If we can arrange to re-excavate those tanks, that is another thing. Old silt is good manure and the re-excavation of these tanks will supply good water to these lands growing potatoes and sugarcane. There are several tanks, but the proprietors are very poor now. If money or a loan can be arranged for the re-excavation of these tanks, there will be a very great increase of the cultivation of potatoes and sugarcane, and if there is legislation enabling the proprietors to charge a certain rate for supplying water from these tanks, the cultivators would very gladly pay those rents to the proprietors in order to get the water from the tanks.

24482. *Mr. Calvert:* What is the difficulty with regard to wells ?—We have got wells that supply water for drinking purposes.

24483. Not for irrigation ?—No, and even for drinking purposes they are dried up in the summer season.

24484. Do you mean there is no sufficient subsoil water for wells ?—There may be very deep; but we have got five wells in our villages.

24485. *The Chairman:* How deep ?—Forty and forty-five feet.

24486. *Mr. Calvert:* Have you ever had any borings done by the department ?—No.

24487. *Rai Bahadur Bannerji:* You want to re-excavate the silted up tanks ?—Yes.

24488. Has the system which is in vogue now in Birbhum and Bankura for re-excavating silted up tanks by the formation of co-operative societies even been tried in your part of the district ?—Yes.

24489. In Birbhum a very large number of tanks have been re-excavated in that way, and there is no reason why it should not be tried in your part ?—I do not know in what way you did it in Birbhum and Bankura.

24490. I cannot take up the time of the Commission; I will explain it to you later on if you see me. In your part of the district irrigation is not carried on from wells ?—No.

24491. You only have drinking water from wells ?—Yes.

24492. And no experiment has been tried to ascertain whether the wells will supply any required quantity of water for irrigation ?—No; we get water from the Eden canal.

24493. For how many months do you get your water from the Eden canal ?—July, August and September. They supply drinking water in summer, but the arrangement they have is very wasteful; the canal is very far from the village and there is no distributary. If we want a little water for the summer season, we have to get water through all the fields and there is loss of water by evaporation and wastage. If there were village channels and distributaries, water could be supplied to the villages very efficiently.

24494. Did you ever apply to the canal authorities for that ?—Yes, we applied, but we were told that under the Eden Canal Act one could not get any channel.

24495. *Rai Bahadur Bannerji :* There is another canal being made now ?—Yes, the Damodar canal.

24496. Would that be useful to you ?—We do not know really what we would do ; and moreover the irrigation authorities do not care about the welfare of the cultivators. Our crop however was very good this year ; it was really a bumper crop, but if we had a supply of water in October we would have got a cent. per cent. crop.

24497. *The Chairman :* How much ?—A cent. per cent. crop. We cried ourselves hoarse and applied to the Assistant Executive Engineer but he had not even the courtesy to reply to our letter. Then I approached the Collector, and a month or so ago an officer of the Irrigation Department came to me with a copy of this letter which I sent to the Collector, who had requested the former to give a note on that. We even approached the higher authorities in the Secretariat but we got very little remedy. But when our Maharajadhiraj of Burdwan was in charge of that department there was an excellent response made. Any complaint made to him was at once taken up. Once we had a very sad experience. There was a very great demand for water in October and there was water in the canal at that time. We wrote several letters to the Executive Engineers, the Sub-divisional Officers and *Zilladars*, but they paid no heed. Then it appears that some cultivators cut the embankment and obtained their water supply. The irrigation authorities brought a criminal case against us and they stopped the water. Then we sent an urgent telegram to the Member in charge of Irrigation and the Maharajadhiraj was at that time in charge at Darjeeling. He telegraphed to the people concerned to supply water at any cost and a copy was sent to us. Then we had all the high officials coming to us ; we got the water and the case was withdrawn.

24498. So you think generally that the staff of the Canal Department is indifferent to your interests ?—Yes, with a few exceptions.

24499. You told the Chairman that you were raising two crops in the year, rice and potatoes mainly, but as you said just now, by September you did not get any more canal water. How then did you grow your potatoes ?—We grew them through tank irrigation.

24500. You told the Commission that when you had been to the Agricultural Exhibition that was held here the other day, the gentleman in charge there could not explain to you the different things you wanted to know. Was it not because you did not come across the right officer ?—I do not know. But later on some gentleman came to me and told me that he was in charge of the propaganda work. It was explained to me later in the afternoon.

24501. So you were satisfied that the man you came across was not the right man to provide the information you wanted ?—That I do not know. I was told that that particular gentleman was the demonstrator of the farm.

24502. *Professor Gangulee :* But then you did get the information you wanted from the Exhibition finally ?—Yes.

24503. *Rai Bahadur Bannerji :* And you have told the Commission that you do not have very much correspondence with the Agricultural Department ?—No.

24504. So that if you did not receive any information on agricultural matters it was not so much the fault of the Agricultural Department as your own ?—The thing is that I might have known of the existence of the department but that department is meant for the uplift and the good of the cultivator. The poor cultivators do not read newspapers, nor these statistical issues of the Government. It is the duty of the agricultural officers to go to the cultivators and teach them, to spread their propaganda work. I do not know whether they have got the time to do it.

24505. And you do not know, I suppose, whether they have the required officer for it ?—No.

24506. From the co-operative credit societies money is generally taken on an interest of 12½ per cent and from the village *mahajan* you get it at the rate of 12 per cent. with compound interest so that the interest is a little more in the case of the co-operative societies ?—I do not know what the system in vogue in co-operative credit societies is.

24507. They do not take any compound interest ?—But only yesterday I was informed by a brother delegate that these banks do charge compound interest.

24508. *Professor Ganguiee :* Co-operative banks ?—Yes.

24509. *Rai Bahadur Bannerji :* Do you think that Messrs. Shaw Wallace and Company for instance have got better arrangements for propaganda work than the Agricultural Department ?—I think so.

24510. Is not the President of the Union Board elected by the members of the Union ?—The President is not elected.

Yes, he is elected by the members.

24511. *Sir Henry Lawrence :* Can you tell me something of the work of the Circle Officer in the Union Board ? Have you ever seen the Circle Officer ?—No.

24512. What does he do ? What are his duties ?—He audits the accounts.

24513. Is he primarily a financial officer ?—Yes.

24514. Does he do no propaganda work ?—Never.

24515. Do you know who this man is in your area ?—No.

24516. Or where he lives ?—No.

24517. There is a Collector at Burdwan, is there not ?—Yes.

24518. How many Circle Officers work under his instructions ?—That I do not know.

24519. How many villages are there in your Union ?—I think about five.

24520. And that forms a Circle, does it ?—That forms a Union and several Unions form a Circle.

24521. How many Unions form a Board ?—A Union and a Union Board are one and the same thing.

24522. Then what is the area of the Circle ?—Several Union Boards make a Circle.

24523. How many ?—In our part of the country I cannot say how many, but I think it may be four or five Unions.

24524. Are the principal landholders of a Circle ever called together to discuss matters of common interest ?—Never.

24525. For instance, men like you who hold about 50 acres of land or thereabouts ?—Never. We are kept in awe by the zamindars.

24526. Do zamindars discourage your meeting and taking part in the work of the Circle ?—The zamindars do very little ; they take very little interest in village affairs ; their case ends as soon as they get the rent ; if they do not get the rent they charge four annas in the rupee as interest per month.

24527. How much rent do you pay to your zamindar for your land ?—I think about Rs. 250 or Rs. 300 and we pay something to Government, say Rs. 250 or Rs. 300 for 50 acres. There are certain lands which we hold as *lakhraj*, rent free.

24528. How much rent do you pay per acre for the land for which you pay rent to the zamindar ?—We pay Rs. 2 per *bigha*. This differs ; sometimes we pay Rs. 1-8-9 or even Rs. 3.

24529. Can you give me a figure for say a consolidated holding of 50 acres ?—I cannot say ; there are different holdings. There are several plots of land and we sometimes pay Rs. 16 for one plot.

24530. And you have never made out your accounts ?—We do not make it out per *bigha* because there are different rates for different lands.

24531. Can you not give me the total ?—I gave you the total just now when I said about Rs. 250 or so.

24532. But you told me certain areas were rent free ? I want to know what you pay for these ?—I cannot say.

24533. *Rai Bahadur Bannerji :* For 100 *bighas* you pay this rent of Rs. 250 ?—About that ; I cannot say definitely.

24534. *Sir Thomas Middleton :* Is your father associated with you in these 50 acres ?—My father is the owner and I simply work for him.

24535. How many brothers work in this manner ?—Two ; I look after this work and my younger brother is a physician.

24536. So that only your father and you are in charge of the fifty acres ?—No, I have got cousins too ; we are a joint family.

24537. I want to find out how many people share in the fifty acres ?—Five.

24538. *Rai Bahadur Bannerji :* And all the five live in the joint family ?—Yes.

24539. *Sir Henry Lawrence :* Are they five adult males or do they make five including women and children ?—Women have got no right.

24540. *Sir Thomas Middleton :* There are five of you who are concerned with looking after the land. How many hired labourers do you have in addition ?—We have three permanent servants.

24541. And how many part-time servants ?—Several, there is no fixed number.

24542. There are eight of you altogether, then, who are working on the 50 acres ?—All of us are not working in the fields. For instance I and a cousin of mine do this other work.

24543. Then how many are actually working ?—Two.

24544. And the three servants ?—Yes.

24545. And of the 50 acres 15 are let on the share system ?—Yes, about that.

24546. So that five of you are working on 35 acres. How many cattle do you require for the working of the 35 acres ; how many plough bullocks ?—Four pairs.

24547. Are these cattle jointly owned, or do your cousins and you have cattle separately ?—No, jointly.

24548. Supposing one of your bullocks dies or grows old, do you buy the bullocks you require in the neighbourhood or do you get them from some distance ?—We try to get them as near as possible, going a little distance away, say two or three miles out.

24549. Is there very little breeding in the neighbourhood ?—There is no breeding at all.

24550. You complain of the cows giving a very small supply of milk now. Could you tell me how you feed them ?—I feed them on straw and paddy.

24551. Have you any idea as to how much you give ?—I cannot give you the amount in weight but I can in bundles.

24552. Can you give me any idea of the weight of the grain you give them ?—We do not give any grain but oil-cakes.

24553. How much ?—About 1½lbs.

24554. For how long a time do you feed them ?—For the whole period.

24555. While the cow is in milk ?—No, always.

24556. You told us the difficulties you had because of malaria, and you mentioned the embankments. Have you been reading Dr. Bentley's book ?—Yes.

24557. Your views are the same as his on that subject ?—I myself have got some experience of that. I live just by the side of that embankment along the Damodar river.

24558. And do the people in your district generally hold these views that you have expressed ?—Yes.

24559. Are the people in your district fairly well off or would you describe them as very poor ? I am, of course, referring to the ordinary cultivators in your district ?—They are very poor.

24560. Do you think that they get enough to eat ?—Not all.

24561. So there is not much chance for their cattle ?—Last year the cattle had to live on a very small quantity of straw.

24562. *Dr. Hyder :* Do you require an extension of primary education in your district ?—Yes.

24563. Are you willing to pay for it ?—No. We are paying too much taxes and these poor cultivators cannot pay a single farthing more.

24564. Do you read newspapers ?—Yes.

24565. Supposing the Agricultural Department issued a very simple fortnightly newspaper devoted chiefly to agriculture and containing information about crops, manure, feeding of cattle and things of that kind do you think such a newspaper would be popular? —It would be very popular provided the cultivators can afford to pay for it. The price of such a paper should not be too high.

24566. Would you like to have an agricultural show like the one we have here once a year at the headquarters of a district ?—Yes, provided something substantial is done there.

It is certainly worth having such shows if some good comes out of them. They should not be shown in name only.

24567. Is much land passing from the hands of the tenants ? Are they selling their rights ?—Not all ; some of them do.

24568. Is that an acute problem in the district of Burdwan ?—The land problem is not very acute but the decrease of produce is a very great problem.

24569. Do you do moneylending business yourself ?—No.

24570. What is the origin of this rent free land that you hold ? Did you get that because you are a priest ?—We purchased it as *lakhraj*.

24571. It did not belong to you originally ?—No.

A delegate : I think the Commission should inquire from us the reason why we contract loans.

The Chairman : I am afraid we cannot have extraneous opinions of this sort because it is not possible to record them, but if you put your views in writing we undertake to give them the most careful consideration.

(The witness withdrew.)

Khan Bahadur MAULVI EMADUDDIN AHMED, B.L., Chairman, District Board, Rajshahi (Bengal)

Replies to the Questionnaire

QUESTION 2.—AGRICULTURAL EDUCATION.—(*i*) No; not sufficient.

(*ii*) There is an urgent need for the extension of teaching facilities in almost all the districts of Bengal especially in the districts of the Rajshahi Division of which I have a personal knowledge.

(*iii*) Teachers in the rural areas should be drawn exclusively from agricultural classes.

(*iv*) The attendances are not at present as numerous as they should be. The reason is that the students are mainly drawn from non-agricultural classes who attend the course in the hope of getting Government service, which they often do not get. If the course of instruction is restricted to agricultural classes only, they will not merely seek Government service but will also try to improve their own lands with the knowledge derived.

(*v*) As at present, Government service.

(*vi*) No; they are rather mostly drawn from non-agricultural classes.

(*vii*) More attention should be paid to the practical training in the field.

(*viii*) I give preference to (*a*) nature-study, (*b*) school plots and (*c*) school farms. It is only by school plots and school farms that agriculture can be taught with real benefit to the students. Each school should have separate school plots and farms and boys from six to ten years of age should be compelled to attend these plots and farms. A teacher recruited from the agricultural class should be selected for special training in some agricultural school, who after finishing his course may be put in charge of these plots and farms to teach the students the practical side of the science.

(*ix*) A few of the students enter Government service but a large number get no occupation.

(*x*) On finishing the course of training the student should be provided with a certain amount of capital to purchase implements and cattle, etc. Effective measures should also be taken to prevent failures of crop on account of drought by irrigation canals, tanks, ponds and wells.

(*xi*) To my knowledge, there are none.

(*xii*) Adult education in rural areas can be popularised by appointing demonstrators and by carrying out demonstrations on the plots of big farmers.

(*xiii*) More demonstrators should be appointed for giving educational facilities in rural areas.

(*a*) *Administration.*—A small Advisory Committee consisting of five members with the District Magistrate as Chairman should control these demonstrators with the Director of Agriculture as the final authority.

(*b*) *Finance.*—A beginning should be made by starting co-operative societies. Highly-paid officers may be done away with and thereby some savings effected.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(*b*) Big cultivators should be induced to attend field demonstrations as well as to apply their knowledge in their own cultivation.

(*c*) Yes; cultivators may be induced to accept expert advice by offering them prizes and by holding fairs and *melas*.

QUESTION 4.—ADMINISTRATION.—(*c*) (*i*) I am not satisfied with the Agricultural and Veterinary Services.

(*ii*) Not satisfied with the present limited Railway and Steamer services. There should be more extensive services of both kinds, which will afford easy transport facilities of the produces of the cultivators.

(*iii*) There are practically no roads in the interior of a district. There should not only be roads but they should be metalled and bridged.

(*v*) and (*vi*).—Posts and telegraph services should likewise be extended and made cheaper. The extension of these services will enable the cultivator to know the latest market rate of the crops and also help them to advertise their own produces.

Agricultural Services.—More low paid officers having expert knowledge should be scattered all over the district.

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Veterinary Services.—The number of Veterinary Assistants at present working are very few and more are needed.

QUESTION 5.—FINANCE.—(*a*) Co-operative societies under the direct supervision of Government should be established.

(*b*) The co-operative societies are the only means which can induce the agriculturists to spend money frugally.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(*a*) (*i*) Borrowing is due to extortion by landlords in the shape of taking *abwabs*, enhancement of rent by them, the recklessness in the matter of expenditure on the part of agriculturists and the highly lowering down of the prices of jute.

(*ii*) The sources of credit are greedy *mahajans*, landlords, *tahsildars* and well-to-do *prodhans* of the village.

(*iii*) The reasons preventing repayment are failures of crop, perennial extortion by landlords, exorbitant rate of interest charged by creditors and insistence on repayment in kind instead of cash.

(*b*) Change of attitude of Government by paying more attention to the grievances of the ryots, taking special measures to prevent landlords to demand *abwabs* and advising agriculturists to be thrifty by appointment of special officers if necessary. These are some of the measures which will lighten the agriculturists' burden of debt. Special measures to deal with rural insolvency are, in my opinion, necessary.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—(*a*) Compelling the cultivators to cultivate their land under co-operative system is necessary.

(*b*) The Hindu and Mahommedan laws stand in the way of consolidation. They can be overcome by co-operative societies and by compelling the agriculturists to work under co-operative system.

(*c*) Legislature is not necessary but it is essentially needed to keep disputes out of courts. Co-operative societies with a Government servant of some position to look after them may settle disputes out of court.

QUESTION 8.—IRRIGATION.—(*a*) Almost all the districts of North Bengal require irrigation. They should have either canals or tanks and wells. Want of fund is the obstacle to the extension of irrigation.

(*b*) I have not seen any canal water being distributed to cultivators.

QUESTION 9.—SOILS.—(*a*) Soils should be improved by application of manures.

(*b*) *Barind* land in the districts of Rajshahi, Malda, Bogra and Dinajpur has suffered great deterioration on account of poor or no supply of manure.

(*c*) Many lands have become overgrown with jungles which need reclamation. Government should compel zamindars to clear the jungles and bring labourers from abroad to settle down and cultivate lands by giving them advances and by making sanitary arrangements to improve their health, etc.

QUESTION 10.—FERTILISERS.—(*a*) Artificial fertilisers may be profitably made more use of. Sulphate of ammonia, potash, etc., may be more extensively used by giving them on credit and taking the prices after the harvest. The prices of these manures should also be reduced.

(*c*) To give them on credit and take the prices after the harvest. In my part of the district the use of artificial manures is just begun and is likely to lead to a considerable increase in the use with the better yields.

(*e*) Sulphate of ammonia has been tried in my district and the result appears to be satisfactory.

(*f*) By lowering the prices of coal.

QUESTION 11.—CROPS.—(*a*) (*i*) Timely supply of water either by irrigation canals or tanks or ponds will greatly improve the existing crops.

(*ii*) Sugarcane, potato and vegetables may be more extensively cultivated.

(*iii*) Seeds should be distributed on credit and the prices realised after the harvest.

(*iv*) Supply of fire-arms to members of co-operative societies under the supervision of Government officials is essentially necessary for the prevention of damage of crops by wild animals.

(*c*) Cultivation of sugarcane, potatoes and jute has met with success.

QUESTION 13.—CROP PROTECTION, INTERNAL AND EXTERNAL.—(*i*) There are practically no measures for protection.

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QUESTION 14.—IMPLEMENTS.—(*a*) and (*b*) Improved implements and machineries should be given to the co-operative societies and prices recovered by long-term credit.

QUESTION 15.—VETERINARY.—(*a*) The Civil Veterinary Department should be independent.

(*b*) (*i*) Yes, it is working well, but the local bodies have not been able to provide sufficient number of dispensaries.

Itinerant Veterinary Assistants are more useful than dispensaries.

(*ii*) No.

(*iii*) Yes, provided the District Boards are not called upon to pay anything.

(*c*) (*i*) No; more itinerant Veterinary Assistants are necessary. If the cultivators are brought under the co-operative system, they can themselves employ a Veterinary Assistant.

(*d*) Cultivators are conservative in having resort to inoculation by Veterinary Assistants but when they have once found the utility of inoculation they are eager to take it. I do not advocate legislation. Appointment of sufficient number of Veterinary Assistants for treatment and propaganda work will remove the difficulty a great deal.

(*e*) There is some difficulty in securing sufficient serum, to meet the demand. The serum ought to be distributed free.

(*f*) Conservativeness of the people, inaccessibility of the places, insufficient number of doctors and prices of serum are some of the obstacles. To my knowledge, no fee is charged.

(*g*) Yes, I consider it desirable. I would advocate the extension of Provincial Veterinary Research Institutions.

(*h*) (*i*) No.

(*ii*) Yes.

QUESTION 16.—ANIMAL HUSBANDRY.—(*a*) (*i*) Yes.

(*ii*) Certainly.

(*iii*) Yes.

(*b*) (*i*) At present considerable overstocking exists, and as a result cattle do not get sufficient grass which is injurious to their health.

(*ii*) There are at present very few enclosed pastures in tilled fields where the cattle may temporarily graze when unyoked.

(*iii*) Yes.

(*iv*) Yes.

(*v*) Yes.

(*c*) August, September and October are the months when the shortage of fodder is keenly felt, due to transport difficulty.

The health of the young growing cattle is permanently ruined.

(*d*) Yes, by compelling the cultivators to grow fodder on certain portions of their land and by insisting on the zamindars to set apart a certain tract of land in each village for pastures, cultivation of fodder as "catch crops" by the Agricultural Department should be encouraged.

(*e*) By legislation only.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(*a*) eight months. He idles away the rest of the year.

(*b*) Yes. Weaving, sericulture, poultry, goat, sheep and cattle-breeding, pisciculture, etc.

(*c*) Want of encouragement, knowledge and capital are some of the obstacles.

(*d*) Yes.

(*e*) Yes, industrial concerns may be moved to rural areas by offering them subsidies and sufficient transport facilities.

(*f*) Yes.

(*h*) Yes, by co-operative village societies under the strict supervision of special officers of Government.

QUESTION 18.—AGRICULTURAL LABOUR.—(*a*) By inducements in the shape of giving them advances and free quarters.

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(*b*) There is a shortage, it can be removed by indenting outside labour by inducements as suggested above.

QUESTION 20.—MARKETING.—The existing market facilities are not satisfactory. I refer to paddy, *rabi* and jute markets. It is mainly due to want of proper transport facilities and as a result the cultivators are deprived from getting the highest prices of their produces. The construction of metalled roads and extension of railway and steamer services will remove the difficulty. The reduction of rate of freight is also essentially necessary.

Besides, there should be co-operative sale societies of the cultivators themselves which should control the sale and advances should be made to cultivators when prices are low. The minimum prices of jute should be fixed and its demand should be broadcasted before the sowing of the jute commences.

QUESTION 22.—CO-OPERATION.—(*a*) (*i*) Government should appoint special officers to encourage the growth of co-operative movements. The existing system is not satisfactory. Every village should come under co-operative society and rules should be framed to suit the condition of the villagers. Government should contribute some amount at least at the beginning.

(*ii*) Respectable villagers should be requested to do the propaganda work.

(*b*) These are the societies which will do immense good but I should like to have co-operative societies first, which in their turn, may have these societies as their branches.

(*vi*) and (*vii*) Agricultural and joint farming societies are the societies which to my mind may do immense good to the cultivators and I wish to establish them on co-operative basis.

(*c*) Legislation is necessary to compel, as far as possible, such persons to join for the common benefit of all.

(*d*) Naogaon Ganja Cultivators' Co-operative Society which is managed by Government has proved a great success with immense potentiality for further development.

QUESTION 23.—GENERAL EDUCATION.—(*a*) (*ii*) and (*iii*) Each middle school, under which I include also the upper primary school, should have school plots and school farms attached to it, as I give preference to practical training in the fields, under teachers specially trained in agriculture. In our poor country, where the agriculture is the main occupation, to draw away the cultivators from their primary occupation will add to the middle class unemployment and be ruinous to the country.

(*b*) (*i*) If in middle schools the pupils are required to get practical training in the field I think both the purposes will be served.

(*ii*) I have no experience of compulsory education in rural areas but I think it is absolutely necessary.

(*iii*) The general poverty of the people who cannot bear the growing high expenses of education, and therefore cannot afford to keep the boys in the school. They require the services of their boys on their field or their wages for their family maintenance.

QUESTION 24.—ATTRACTING CAPITAL.—(*a*) Government should advance money to big agriculturists to carry on improvements. The money is to be repaid on easy instalment system. Persons having capital do not advance money as agriculture has not been found paying.

(*b*) Uncertainty of the results from the improvements effected and want of funds and of proper knowledge.

QUESTION 25.—WELFARE OF RURAL POPULATION.—(*a*) Drastic measures should be adopted to put a stop to illegal *abwabs* and other illegal exactions. Special officer should be appointed for the purpose and every encouragement should be given to cultivators to proceed against the wrong-doers.

(*b*) I am in favour of Government conducting economic survey. There should be enquiries as to how much the landlord men extort from tenants in illegal ways, how much the tenants themselves recklessly spend money, how the *mahajans* and traders taking advantage of cultivators' poverty purchase their produces at nominal prices.

(*c*) I know much of rural life and I know illegal exactions by landlords, exorbitant demand of *nazars* by landlords for allowing tenants to excavate tanks and other sources of water-supply, advances made to agriculturists by traders and *mahajans* to get their produce at cheaper rates and their own recklessness are some of the causes which have brought about their present extreme poverty and utter helplessness.

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Oral Evidence

24572. *The Chairman :* Khan Bahadur Maulvi Emaduddin Ahmed, you are Chairman of the District Board, Rajshahi ?—Yes.

24573. You have provided the Commission with a note of evidence that you wish to give. Have you any statement of a general character that you wish to make at this stage or shall I ask you some questions ?—I have only one statement of a general character to make, which I have also put in in my note. The landlords and the *mahajans* have been oppressing the tenants to a great extent and unless they are relieved of the burden of these *mahajans* and zamindars, there is no hope for the ryots.

24574. Are you yourself a cultivator ?—I am not a cultivator but I am a *jotedar*. I have got about 300 acres of land; I cultivate 100 *bighas* and the rest I give to other cultivators on the *adhi* system.

24575. That is, half and half the produce ?—Yes.

24576. Your note is very clear on the points that you have dealt with and there are only one or two questions that I should like to ask you. On pages 557 and 558 of your note you say that you are not satisfied with the Agricultural and Veterinary Services. What is the matter with them ?—I do not wish to make a general complaint nor do I wish to speak against the Director of Agriculture. I know him personally and both he and the Chemist take a good deal of interest; but I cannot say that I hold such a high opinion of other officers. For instance, the Deputy Director of Agriculture does not take so much interest as he ought to take nor do the Superintendents of various farms take so much interest in demonstration as they ought to. Of course, small demonstrators do take a little interest. The low paid officers who are getting Rs. 25 or Rs. 30 do take a good deal of interest in the cultivators. Now, with regard to the Veterinary Service, the District Boards are required to keep Veterinary Assistants and we pay practically the whole of their pay. Government do not pay anything. Not only have we got to pay the salary of these Veterinary Assistants, we have also got to pay the price of the serum that we get. This is a terrible sum for the District Board. What I mean to say is that the resources of the District Boards are too small and they cannot afford to pay the price of the serum when there is an epidemic. On account of the shortness of funds, they cannot employ a sufficient number of Veterinary Assistants nor can they purchase a sufficient quantity of serum to deal with the epidemic. I may tell you that this year there was an epidemic in my district and the cattle have died by hundreds and the poor cultivators are now crying themselves hoarse.

24577. You complain also about the lack of communications ?—In that direction I do not want any pecuniary help from the Government. All that I want is that the District Boards may be empowered to metal the roads and realise the cost by taxation. They have provided for this in the Municipal Act but they refused to give us sanction. We then moved the then Minister and he also refused sanction saying that the Government of India might come in the way and so it could not be done. Of course, if you can give us money, it is all right; but I say that there ought to be a section in the Local Self-Government Act which would enable the District Boards to metal the roads and levy tolls. There is a provision in the Local Self-Government Act for bridges and I have constructed big bridges costing Rs. 1,50,000 which are being paid by the levy of tolls, and the people have not murmured.

24578. On page 558 you attribute the extortions of the landlords as the first cause of indebtedness and of borrowing in this Presidency. Is it within your knowledge that debt exists in the ryotwari areas in the same way as it exists in the zamindari areas ?—What I mean to say is this that the landlords are, generally speaking, absentee landlords. Of course, the landlords are very good persons but the sad part of the whole thing is that they leave the country and go to the big towns, and leave their affairs to be managed by their managers who are low paid officers. They really exact 4 annas for each rupee every year and sometimes they have realised as much as 8 annas per rupee.

24579. *Professor Gangulee :* For what ?—For *abwabs* only, for self-interest. I know of instances. One absentee landlord sent a telegram to his manager saying "Borrow or steal, but let me have Rs. 1,000". These are real facts. The landlord only wants Rs. 1,000 but the manager collects Rs. 5,000 and steals Rs. 4,000 and sends the landlord only Rs. 1,000 down in Calcutta.

24580. *Sir Henry Lawrence :* What is the *abwab* ?—It is an illegal exaction and is not authorised by the law. This sort of thing is happening every year.

24581. *The Chairman :* Would you turn to page 559 of your note. In answer to our Question 15 (*c*) (*i*) you say, "No; more itinerant Veterinary Assistants are necessary. If the cultivators are brought under the co-operative system, they can themselves employ

a Veterinary Assistant." Do you mean a Veterinary Surgeon in private practice?—What I mean to say is that more men would be in demand and they would be employed as private practitioners.

24582. They would be entirely non-official?—They would be entirely non-official but they would be under the supervision of the Government.

24583. Did you have personal experience of the difficulty in obtaining serum during the recent epidemics of which you spoke a moment ago?—There is some delay no doubt, but we do not care so much for the delay as we do for the price of the serum. We find it beyond our means to pay the price. This year I had to spend Rs. 4,000 extra on serum. Beyond that I could not go because our budget does not allow of it. Serum ought to be absolutely free, and I pray that you should pass orders just now to that effect.

24584. You realise that somebody has got to pay for it?—I know that Government will have to pay but the Government have been taking taxes. They can curtail the appointments of Circle Officers and other big officials and pay the price of serum.

24585. Do you in this connection distinguish between Government and the tax-payer as such?—What I mean to say is that the Government can do it. In fact, whatever Government wish to do, they can do. They can abolish the posts of Circle Officers where they are not needed, so that they may give serum free.

24586. On page 560, you suggest that for the protection of the cultivator a minimum price for jute should be fixed by rule. Have you ever studied the problem of the fixation of prices?—I have not studied it but I may be permitted to point out that it would have been much better if jute had not been grown in Bengal at all. We do not know the extent of the demand; no one tells us what the demand is. Ignorant people grow a large quantity of jute and in the forecast the quantity is reduced. Why not let us have the demand as well, so that the cultivators may be warned or the Circle Officers may warn the cultivators. I did not grow jute in my whole life; I was against it. But my headman prevailed upon me to grow jute last year and I did it in 3 *bighas* and obtained Rs. 300. This was very tempting and this year I grew jute on 15 *bighas* and I have not been able to realise the amount that has been spent on it.

24587. Do you not see some danger in fixing minimum prices? If you fix them by statute, they are inclined to be maxima as well?—In that case I shall grow a little less. They have been doing it with regard to *ganja*.

24588. What you require, perhaps, is information as to the amount of jute in storage?—In storage, as well as what will be required for export to European countries. We do not know exactly what should be done; something ought to be done. With regard to *ganja*, Government have been doing it. If a larger quantity is grown, they burn any quantity which is above their requirements, in order to get better prices. In the same way, some sort of arrangement should be made.

24589. Some attempt at limiting the extreme fluctuations in prices?—Yes, I mean that.

24590. *Sir Henry Lawrence:* Who is it that burns the *ganja*?—It is done by Government.

24591. Who makes good the cost of the burnt stuff?—They do not pay for it. They burn a certain quantity proportionately. The whole of the quantity grown is taken into one storage, and the quantities grown by various people are proportionately burnt. The result of this is that all the growers get a price.

24592. Somebody must pay for it?—Those who grow more have to suffer. It is a Government monopoly, and it is managed in that way, which has the effect of raising the prices.

24593. *Rai Bahadur Bannerji:* Is it not a monopoly of the co-operative society?—No, it is a Government monopoly; Government keep a certain quantity, burn the rest and fix the prices.

24594. *Sir Henry Lawrence:* You suggest that jute should be treated in the same way?—It is a very great problem in regard to jute. I cannot at once say what sort of arrangement ought to be made, but something in that direction ought to be done.

24595. You are aware that *ganja* is grown on a few thousand acres, whereas jute is grown on a good many lakhs of acres?—Yes.

24596. You want to enforce the principle?—Yes.

24597. *Sir Thomas Middleton:* You let most of your land on the half and half system?—Yes.

24598. What does it mean exactly; do you get half the gross produce of grain and also half the gross produce of straw, or is it half of the grain only?—There are several systems, but mainly two are in vogue; in certain cases, half the grain as well as half the straw is shared, and in others only half the grain is shared and not the straw.

24599. You supply the land. Do you supply any assistance by way of cattle or anything else to the cultivators?—Yes; I give them cash in advance. Of course, there are persons who take interest on it, but personally I do not take any interest. I advance money during the season and get it back.

24600. So that the cattle belong to the tenant?—Yes, they do not belong to me.

24601. Do you do anything in the way of assisting them to get seed?—Yes. Sometimes, I purchase seed from the farm and distribute it among my tenants, getting the prices for it afterwards.

24602. You recommend sulphate of ammonia; you say that sulphate of ammonia has been tried in your district; for what purpose?—For paddy. I have used it for paddy, and I may be permitted to say that I am thankful to the private company which thrust it on my notice. They have been taking more interest in this direction than Government. This year I tried it on transplanted paddy, and the results have satisfied me. Some other cultivators have tried it for jute, and they say that it has done some good to their jute crop too.

24603. When you say that it has satisfied you, could you give an estimate of the profit?—Without using sulphate of ammonia I used to get 5 maunds per *bigha* or 15 maunds per acre, and after applying the fertiliser I got about 24 maunds per acre.

24604. How much sulphate of ammonia did you give to the land?—Fertiliser worth Rs. 9 for 6 *bighas*. The company recommended that that quantity should be used for 4 *bighas* but my headman told me that it would perhaps be too much and we had better be cautious.

24605. You point out that, as a result of the neglect of cattle, young growing cattle are permanently injured?—That is because they cannot get fodder. As you have come all the way from England, I may be permitted to relate to you one little experience of mine. A gentleman from England was coming out to India to join the Police Service, and he was coming out here for the first time. I met him on board the steamer. After he came out here, I asked him what struck him most in this country, and he replied that the cattle struck him most. He said that they were extremely poor specimens compared with those in England, so much so that he could scarcely call them cattle.

24606. Your proposals for improving the condition of cattle are to compel the cultivators to grow fodder crops on certain portions of their lands?—Yes, and the zamindars should set apart a portion of land as pasture.

24607. How can you compel them?—Some sort of persuasion can be exercised by the Collector. In this connection, I may say that Government have taken the wrong step in creating these appointments of Circle Officers. In my opinion, they ought to have looked to the improvement of agriculture first, and then taken in hand the other things. I say that there is not so much necessity for some of the other things which Government are doing; they do not pay as much attention to agriculture as they ought to. Instead of the Circle Officers, there ought to have been agricultural officers.

24608. How can agricultural officers compel the cultivators to grow fodder crops?—By persuasion they can do it; by persuasion many things can be done. If they know that it is the order of the Collector, they will grow it.

24609. You as landlord are in a stronger position to exercise compulsion? Have you got any land set apart for fodder?—I myself keep some land for fodder, but landlords do not generally do it. As regards persuading the cultivators to set apart such land, I have not done anything and if I am to blame I am quite willing to take the blame; landlords do little for the tenants.

24610. Supposing you did compel your cultivator to set apart land for fodder, would there be enough land left to feed himself?—That is the great problem; most of the cultivators have not got sufficient land for the purpose.

24611. *Sir James MacKenna:* Where does the District Board get its serum from? Direct from Muktesar?—We have been getting it from Kasauli.

24612. Is it anti-rinderpest serum?—Yes.

24613. Do the District Boards charge the cultivator for it?—No.

24614. It is a direct charge on the District Board's fund?—Yes.

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24615. *Professor Gangulee:* Do you receive the necessary guidance from the District Magistrate in your District Board work ?—There is no necessity for it.

24616. You do not want the District Magistrate to have anything to do with the District Boards ?—As sufficiently educated persons are available in the district, there is no necessity for it. But with regard to agriculture, the District Magistrate, with the help of four or five non-official persons, will be able to do much because there is no other person who is in touch with the district to that extent.

24617. Can you tell the Commission something about the chief activities of your District Board ? Are you paying more attention to roads ?—I have been paying more attention to dispensaries. When I first became Chairman, there were only eight dispensaries, but now there are 30 dispensaries for saving human life, but unfortunately there is nothing to save the cattle. We also pay some attention to education and there is work in other directions.

24618. Have you any Union Boards in your district ?—They have just begun.

24619. What are your views about the Union Boards ?—I have already told you that the Union Boards will be able to do a little work, no doubt; but I think it would be better if these Circle Officers paid more attention to starting agricultural associations than these political bodies.

24620. You do consider the Union Boards to be political bodies ?—I do consider them to be so, to a certain extent.

24621. In what way ?—Because, the District Magistrate wants to be in touch with the people, and the Circle Officers exercise a good deal of control over the people politically also.

24622. Your main idea is that the District Magistrate should not have anything to do with the people ?—I do not mean that. The District Magistrate is not to blame; the idea must come from Government; if the District Magistrate is required to pay more attention to agriculture than he does at present, he will be glad to do it.

24623. Just now, you said that the Union Boards are really political institutions ?—Yes.

24624. We should like to get from you your reasons for holding that view ? After all, what have they been doing ?—They have been looking after some roads and collecting *chowkidari* taxes. All these things they have been doing, but not much work for the improvement of the country. I do not personally see any very useful work that is being done by the Union Boards, Government want to keep more control over the people through these Union Boards.

24625. You are in touch with their work ?—Yes.

24626. What is the relation between the District Boards and the Union Boards ?—There is not much relation between us; we only pass their budget; we are to a certain extent rather aloof from them; I, as Chairman, do visit them.

24627. How did you come to know about this sulphate of ammonia ?—Messrs. Shaw Wallace and Co. sent their agents to me. In fact they thrust it upon me and I am thankful that they did so. At first I was conservative, but they sent their agent again and again and thrust it upon me.

24628. By their intensive propaganda ?—Yes.

24629. Do you get any assistance from the Rajshahi farm ?—I do get assistance from it, more assistance from the demonstrators and other low paid officers than from the high officers; I do not get any assistance from the Superintendent. In this connection, I should like to suggest that when anything has been tried and found successful, that thing should not be grown on the Government farm.

24630. Have you, at any time, visited the Rajshahi farm ?—I have visited it several times, and I take a good deal of interest in what they are doing. This year I have grown sugarcane from seedlings of the Rajshahi farm. In this connection, I may be permitted to say that if the department grows these things, sometimes they look to their own interest. If sugarcane is grown there, they look to their own interest in the matter of how the cultivation is done; sometimes they are in need of seedlings, and they cannot afford to give them to other persons. What I mean to suggest is that now that sugarcane has been provided in our district and it has been found profitable for cultivation, they should not cultivate it on the farm. That will assist the farmers, and there will not be any competition between the farm itself and the cultivafors themselves as regards seedlings.

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24631. Where is the competition ?—Because there is want of seedlings ; sometimes we find that.

24632. Are you in touch with the co-operative movement ?—Not very much ; I know something about it.

24633. On page 560 of your note, you say, " Government should appoint special officers to encourage the growth of co-operative movements. The existing system is not satisfactory." Could you tell us the reasons ?—When I wrote that, I was thinking of the carrying on of agriculture on a co-operative basis ; 100 cultivators may join together and they may jointly grow the crop ; that is what I meant there.

24634. Again and again you mention that the co-operative movement should be entrusted to Government officers ?—It should be under their supervision ; that is not entrusting it to them ; there should be some person to supervise it properly.

24635. You refer to the Naogaon Ganja Cultivators' Co-operative Society ; is it managed by Government ?—Not practically by Government. The society consists of non-officials, but the District Magistrate is the Chairman and another Government official is the Deputy Chairman ; it is managed by the co-operative society, but it is rather a joint system as they have those persons at the head.

24636. I take it you had no opportunity of studying the co-operative movement ?—I have studied it, to a certain extent. I think generally Government assistance is necessary, though there may be places where it is not necessary, where the people are sufficiently advanced and it can be dispensed with.

24637. Are you a member of any co-operative bank ?—No, I am not.

24638. *Mr. Calvert :* Does your District Board select its own teachers for primary schools ?—Yes.

24639. Does it try to get as teachers, sons of actual cultivators ?—No, we have not tried it as yet. I have just begun one school where they are trying to teach cultivation.

24640. Do you think that your teachers understand the difficulties of the actual cultivators ?—They do not.

24641. They cannot help the cultivator out of his difficulty ?—No.

24642. Do you think they would be more successful if they were drawn from the actual cultivating class ?—Certainly ; that should be the idea. Not only that, but every officer in the Agricultural Department should be drawn from the cultivating class.

24643. It has been suggested that the use of cowdung as fuel should be stopped ; do you think it is practicable ?—It is not practicable because other fuel is not easily available ; but if you can lower the price of coal it may help a little.

24644. *Rai Bahadur Bannerji :* You say that the Superintendents of farms of Rajshahi and other places are not so attentive towards the cultivators as the propaganda officers and the agents of Messrs. Shaw Wallace and Co. ?—Yes, with regard to manure and other things.

24645. There is only one farm Superintendent for the whole district, whereas Messrs Shaw Wallace and Co. or any other company have got many agents ; and they come to do their business ?—Yes ; more officers are necessary.

24646. These companies can afford to appoint more officers ?—Yes ; why should not Government do it ? They can also afford to pay.

24647. That is your intention ?—Yes ; I do not blame the department ; it has been doing a lot of work, there is no doubt about that. They have done much work in the cultivation of paddy, sugarcane and other things.

24648. You want more propaganda officers ?—Yes ; and also demonstrators.

24649. You recommend that Government should give serum free ?—Yes.

24650. If it is not possible for the Government to do so, what other method do you suggest to prevent the great mortality amongst the village cattle ?—At present I cannot say. You can compel the agricultural societies, as I have suggested, to raise subscriptions and that sort of thing and, if they get sufficient money, they can purchase serum.

24651. If a man loses a pair of bullocks, he loses from Rs. 200 to 400 ?—Yes.

24652. So should he not pay Rs. 5 in order to save Rs. 400 ?—But a sufficient quantity of serum and men are not available. The District Board cannot entertain so many Veterinary Assistants.

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24653. That is your complaint ?—Yes ; the other thing is they are conservative and the cultivators do not like to pay.

24654. You think that, if coal is offered at a cheaper rate, it would be accepted in the country generally as fuel ?—Yes.

24655. How can that be possible ?—I do not know exactly how it can be done ; but that is the only suggestion that I can make.

24656. The price of coal must be reduced and the railways also must reduce their railway freights ?—Yes ; I have suggested that the railway freights must be reduced. That is another grievance ; the railways have increased their freights.

(The witness withdrew.)

The Commission then adjourned till 9-30 a.m. on Monday, the 10th January, 1927, at Pusa.

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Village improvement by spare-time labour, possibility of (*Mitra*) 19,833, 19,834.

AGRICULTURAL LABOUR.

Cultivable uncultivated lands, area of (*Bentley*) (245), (*Finlow*) 18,347-18,352, 18,419-18,423, 18,428, (*Momen*) 22,154-22,161.
————————, colonisation of, suggestions for (*Mitra*) (134), (*Mukherjee*) (180), (*Bentley*) (245).
————————, difficulties of cultivating (*Finlow*) 18,424-18,431.
————————, inhospitable (*Finlow*) (13), 18,108-18,110, 18,354-18,356.

AGRICULTURAL LABOUR—*contd.*

Cultivable uncultivated lands, method of obtaining, by ryots (*Momen*) 22,162-22,172.
———————————, unsuitable for giving to agricultural graduates (*Finlow*) 18,111.
———————————, *see also* Middle-class youths *under* **EDUCATION.**
Importation of labour into Bengal, considerable (*Finlow*) (12).
Labour for tea gardens, details regarding (*Indian Tea Association*) 22,987-22,990, 23,059-23,065, 23,076-23,087, 23,104-23,106, 23,131, 23,132, 23,149-23,151.
Labourers, as a rule dishonest (*Ahmed U*) (532), 24,162-24,166.
————, piece-rate wages for (*Ahmed U*) 24,163, 24,164.
Migration of labour, confined to wandering tribes (*Peddie*) 23,387-23,395.
————————, from Bengal (*Finlow*) (13), 18,014-18,019, 18,360-18,365.
————————, is local only (*Mullick*) 22,485-22,495.
————————, obstacles to, and suggestions for overcoming (*Indian Tea Association*) (389), 22,986.
————————, seasonal (*Mitra*) (134).
————————value of publicity to assist (*Momen*) (327).
Shortage of labour, causes of and remedies for (*Finlow*) (13), (*Mitra*) (134), (*Mukherjee*) (180), (*Bentley*) (245) (*Mullick*) (352), 22,467, (*Ahmed U.*) (536), (*Ahmed M.*) (559, 560).
————————, malaria and other illnesses as cause (*Mukherjee*) (180), (*Bentley*) (245), (*Mullick*) (352).
Unemployment amongst *bhadralog* and Anglo-Indian classes (*Finlow*) (12).
————————, proposal for meeting, by establishing larger farms (*Finlow*) (12, 13).
————————, report of committee of investigation (*Finlow*) (12), 18,370.
————————, scope for settlement, in Assam (*Finlow*) (13).
————————, *see also* Large farms *under* **ATTRACTING CAPITAL.**

AHMED, Khan Bahadur Maulvi Hemayat Uddin, Pleader, Barisal, Bengal, (169-171), 20,011-20,075.

AGRICULTURAL INDEBTEDNESS:

Causes of indebtedness (169).
Control of credit, undesirable (169).
Mohammedans, do not generally object to taking interest 20,062-20,070.
Reasons preventing repayment (169).
Sources of credit (169).
Usurious Loans Act, should be enforced (169), 20,056-20,061, 20,071.

AGRICULTURAL INDUSTRIES:

Cultivators, have ample spare time at their disposal (170).
Government, should establish industries using agricultural products (170).
Gunny bag and *chat* making (170).

ANIMAL HUSBANDRY:

Fodder crops, such as guinea grass, can be fitted in with present rotation 20,016-20,020.
———————————, need for growing (169).
Improvement of breeds, badly needed (170).
————————, may be effected by provision of better bulls and grazing grounds (170).

CO-OPERATION:

Audit by Co-operative Department, defects of 20,030-20,037, 20,055.
Central Banks, number of primary societies under 20,026, 20,027.
————————, procedure at meetings of 20,045-20,049.
————————, procedure of, in dealing with loan applications 20,043, 20,044.
————————, supervision by 20,025, 20,028, 20,029.

AHMED, H.—*contd.*

CO-OPERATION—*contd.*

Co-operative movement, chiefly confined to credit societies in Barisal district (170).
———————————, illiteracy the main obstacle to (170).
Credit societies, audit of, *see* Audit.
———————————, reserves of, *see* Reserves.
———————————, success of (170, 171).
Government, role of, towards co-operative movement (170).
Registrar, some of work done by, should be entrusted to private persons (170), 20,049-20,054.
Reserve funds, control of by Registrar undesirable (170), 20,040-20,042.

DEMONSTRATION AND PROPAGANDA:

Cultivators, disinclined to take expert advice on account of cost of methods suggested (169).
Demonstration farms, should be self-supporting (169).
Demonstrations, if showing fair margin of profit and within cultivators' means, will be adopted (169).
———————————, should be made on cultivators' own holdings 20,012-20,015.

EDUCATION:

Agricultural middle schools, need for (171).
Compulsory primary education with agricultural bias, should be introduced (171).
Primary education, present system of, unsatisfactory (171).
———————————, should include education in agriculture (171).

FINANCE:

Co-operative movement, the best means of financing cultivators (169).
Taccavi, is not popular (169).

HOLDINGS:

Legislation to keep disputes out of the Courts, need for (170).

VETERINARY:

Contagious diseases, suggestions for control of (169).
Dispensaries (169).
Research, should be conducted in Provinces (170).
Serum, cannot always be obtained in time (170).
Veterinary Department, should be under Director of Agriculture (169), 20,038, 20,039.

AHMED, Khan Bahadur Moulvi Emaduddin, B.L., Chairman, District Board Rajshahi (557-560) 24,572-24,656.

ADMINISTRATION:

Agricultural Department, need for increasing subordinate staff of (557).
———————————, service afforded by, unsatisfactory (557), 24,576.
District Boards, relations of, with Revenue officers 24,615, 24,616.
———————————, with Union Boards 24,625, 24,626.
———————————, should be empowered to metal roads and recover cost by taxation 24,577.
Posts and telegraphs, need for cheaper and more extended service by (557).
Railway and steamer facilities, lack of, a hindrance to marketing (557, 560).
———————————, unsatisfactory (557).
Union Boards, are in some respects political institutions 24,618-24,624.
———————————, relations of, with District Boards 24,625, 24,626.

AHMED, M.—*cont.*

AGRICULTURAL INDEBTEDNESS :

Abwabs, taking of, by landlords, should be prohibited (558, 560), 24,579, 24,580.

Causes of borrowing (558).

Landlords and moneylenders, are oppressing cultivators (558, 560), 24,573, 24,578.

Reasons preventing repayment (558).

Rural insolvency, special measures to deal with, unnecessary (558).

Sources of credit (558).

AGRICULTURAL INDUSTRIES :

Cultivators, work only eight months a year (559).

Factories, may be encouraged to move to rural areas by offering subsidies and adequate transport facilities (559).

Obstacles to subsidiary industries (559).

Suggestions for subsidiary industries (559).

AGRICULTURAL LABOUR :

Shortage of labour, suggestions for overcoming regional (559, 560).

ANIMAL HUSBANDRY :

Cattle, health of, permanently ruined by underfeeding (559), 24,605.

Common pastures, overstocked (559).

Fodder, cultivation of, as catch crop, should be encouraged (559).

———, shortage of, due to transport difficulties (559).

————————, period of (559).

———, supply of, may be increased by compelling cultivators to grow certain amount and landlords to set aside land in each village for pasture (559), 24,606-24,610.

BATAI SYSTEM : Operation of 24,597-24,601.

CO-OPERATION :

Agricultural and joint farming societies, value of (560).

Co-operative movement, existing system unsatisfactory (560).

————————, should be encouraged by appointment of special officers (560), 24,633, 24,634.

Credit societies, should be under direct Government supervision (558), 24,636.

Naogaon Ganja cultivators' co-operative society, success of (560), 24,635.

Sale societies, need for (560).

Villages, should each come under co-operative society assisted by Government funds (560).

CROPS :

Firearms, should be supplied to members of co-operative societies to prevent damage by wild animals (558).

Seed, should be distributed on credit and cost realised after harvest (558).

DEMONSTRATION AND PROPAGANDA :

Cultivators, large, should be induced to attend demonstrations and adopt improvements (557).

————, may be induced to adopt expert advice by offer of prizes and holding of fairs (557).

Demonstration work by Agricultural Department, hindered by lack of staff 24,644-24,648.

Demonstration farms, work of 24,629, 24,630.

Demonstrations of fertilisers by private firms, better than that of Agricultural Department 24,627, 24,628, 24,644, 24,645.

AHMED, M.—*cont.*

EDUCATION :

Adult education, may be popularised by appointing more demonstrators (557).
Agricultural graduates, should be provided with capital for purchase of implements and cattle (557).
Child labour, demand for, interferes with education (560).
Compulsory primary education, necessary (560).
Government service, the chief inducement to study agriculture (557).
School farms or plots, should be attached to upper primary and middle schools (560).
Teachers in rural areas, should be drawn from agricultural classes 24,638-24,642.
Teaching facilities, urgent need for extension of (557).

FERTILISERS :

Artificial fertilisers, price of, should be reduced (558).
————————, propaganda for, by private firms 24,627, 24,628, 24,645, 24,646.
————————, scope for employment of (558).
————————, should be supplied on credit and price recovered after harvest (558).
Cowdung as fuel, use of, may be limited by lowering price of coal (558), 24,643.
Sulphate of ammonia, use of (558), 24,602-24,604.

FINANCE :

Co-operative movement, the best means of financing agricultural operations (558).

HOLDINGS :

Co-operative societies, with Government assistance, may keep disputes out of courts (558).
Cultivators, may be compelled to cultivate land co-operatively (558).
Hindu and Mohammedan law, an obstacle to consolidation (558).

IMPLEMENTS :

Improved implements, may be supplied to co-operative societies on long term credit (559).

IMPROVEMENTS : Government should advance money to big agriculturists to carry out (560).

IRRIGATION :

Irrigation, lack of funds for, the chief obstacle (558).
————————, scope for, in Northern Bengal (558).

MARKETING :

Co-operative sale societies, need for (560).
Existing market facilities, unsatisfactory (560).
Jute, in storage, making information concerning known to cultivators 24,588.
——, minimum price of, should be fixed and broadcast before sowing commences (560), 24,586-24,596.
Post and telegraph services, extension of, will enable cultivators to learn market rate of crops (557).
Transport facilities, lack of, an obstacle (560).

SOILS :

Barind land, has deteriorated for want of manure (558).
Jungles, need for reclamation of land covered by (558).

VETERINARY :

Cultivators, organised co-operatively, might employ Veterinary Assistants (559), 24,581, 24,582.
District Boards and dispensaries 24,617.
Inoculation, popular once its advantages are realised (559).
Serum, cost of, borne by District Boards 24,611-24,614.

AHMED, M.—*cont.*

VETERINARY—*contd.*

Serum, cost of, militates against use 24,650-24,653.
———, occasionally difficult to obtain (559), 24,583.
———, should be distributed free (559), 24,583-24,585.
Veterinary Assistants, itinerating, more useful than dispensaries (559).
————————————, need for further (558).
Veterinary Department, should be independent of Agricultural Department (559).
Veterinary research, should be conducted in Provinces (559).

WELFARE:

Economic surveys of villages, should be carried out by Government (560).

AHMED K.B. Moulvi Wasim Uddin, B.L., Chairman, District Board, Pabna (532-537), 24,157-24,252.

ADMINISTRATION:

Agricultural Dept., need for increasing subordinate staff of (533).
Meteorological Dept., information supplied by, does not reach cultivators (533).
Postmasters in villages, should be appointed from village teachers (533).
Railway officials, are corrupt (533) 24,167-24,171.
————————, better educated men should be appointed for (533) 24,172, 24,173.
Roads, bad condition of, a hindrance to marketing (533, 536).

AGRICULTURAL INDEBTEDNESS:

Causes of borrowing (533).
Damdopat, rule of, should be enforced (533), 24,201-24,206.
Law of Limitation, abuses under (534).
Litigation, is chiefly with regard to indebtedness and rents, 24,217.
Moneylenders, demand exorbitant interest from April to July (533).
————————, the principal source of credit (533).
Mortgage and sale, right of, should be limited (534), 24,214-24,216.
Usurious Loans Act, unsatisfactory because many judicial officers are in sympathy with moneylending classes (533, 534), 24,251, 24,252.

AGRICULTURAL INDUSTRIES:

Cultivators, activities of, during different months, 24,186-24,188.
————————, have little spare time for subsidiary industries in Pabna district (536), 24,185.
Suggestions for subsidiary industries (536).
Tanks for pisciculture, excavation of, often forbidden by zemindars (536).

AGRICULTURAL LABOUR:

Labourers, as a rule dishonest (532), 24,162-24,166.
————————, piece-rate rates for 24,163, 24,164.
Shortage of labour, exists in Bengal (536).
————————————, seasonal, methods of meeting (536).

ANIMAL HUSBANDRY:

Common pastures, facilitate spread of disease (536).
Fodder, period of shortage of (536).
Pasture, reservation of land for, may be encouraged by remission of revenue (536).
Improvement of breeds, suggestions for (536).

ATTRACTING CAPITAL:

Liability to loss occasioned by fluctuating prices of agricultural produce, discourages investment of money in land (537).

AHMED, U.—*cont.*

CO-OPERATION :

Audit fees, should be reduced or abolished (537).
Central Banks, have been of benefit to cultivators (537).
Credit societies, growing unpopularity of, due to unlimited liability of members 24,174-24,177, 24,222-24,225, 24,243-24,250.
Ignorance of majority of members of co-operative societies, renders them liable to exploitation by literate few (537), 24,227-24,229, 24,234-24,242.
Liability of members of co-operative societies, should be limited (533), 24,178, 24,179.
Non-officials, may render valuable help to co-operative movement 537.
Purchase and sale societies, generally fail through ignorance of members (537).

CROPS :

New crops, scope for (535).
Wild boars, need for campaign to destroy (535).

CULTIVATION :

Soil examination, value of, to ensure proper rotation and growing of suitable crops (535).
Tillage, improvement of existing system of, depends on provision of better implements and more labour (535).

DEMONSTRATION AND PROPAGANDA :

Demonstration farms, are run on expensive lines (532), 24,207, 24,208.
———— ———————, experiments at, must be kept distinct from demonstrations 24,160.
———— ————, examples of success of (532), 24,209-24,212.
———————, profit and loss accounts should be kept at (532)
Demonstrations on cultivators' own fields, value of (532), 24,161.

EDUCATION :

Cultivators, do not appreciate the real object of education (537).
Maktab schools 24,220.
Nature study, useful (532).
Primary education, financing of 24,219, 24,233.
————, need for compulsory (537), 24,232.
School farms and plots, of little value (532).

FERTILISERS :

Adulteration, should be prevented by legislation and instruction as to its detection (534).
Demonstrations of value of fertilisers, useful (534).

FINANCE :

Long term credit, should be given on easy terms for purchase of land and cattle, and building (533).
Short term credit, at low interest, should be given for seed, fodder and wages (533).
Taccavi, need for strict supervision of repayment of (533).
————, should be given to individual cultivators and not on joint bond (533).

HOLDINGS :

Joint cultivation, may minimise loss due to excessive subdivision (534).
Legislation for consolidation, should provide for adequate compensation where necessary (534).

IMPLEMENTS :

Improved implements, extra cost of, should be paid by Government to start with (535).
————————, need for (535).
————————, value of demonstrations of (535).

AHMED, U.—*cont.*

IRRIGATION:

Irrigation in Pabna district, damage due to lack of (534).
————————, need for (534), 24,181, 24,184.
————————, nothing done to provide 24,180.
————————, wells for, unsatisfactory 24,182, 24,183.

MARKETING:

Communications, need for better, to facilitate marketing (533, 536)

SOILS:

Agricultural and Sanitary Improvements Act, use of, should be encouraged (534).
Soil investigation, need for (535).
Waterlogging, damage done by, in Pabna district (534).

VETERINARY:

Common pastures, lead to spread of disease (536).
Dispensaries, may be under Government rather than local bodies (535).
————————, need for further (535).
Inoculation, prejudices against, disappearing (535).
Legislation to prevent spread of contagious disease, need for (535).
Veterinary Surgeons, number of, inadequate (535).

WELFARE:

Economic surveys of villages, need for (537).
Government should take initiative in promoting sanitary measures in rural areas (537).
Tenants, should be given power to make wells, etc. (537).

ANIMAL HUSBANDRY.

Agricultural Dept., has neglected animal husbandry (*Momen*) 22,192.
Animal nutrition, importance of adequate, not recognised by cultivators (*Burrows*) 23,680, 23,681, 23,819, 23,820.
————————, investigation of value of (*Kerr*) (101) 19,201-19,208, 19,225, (*Mitra*) (133).
Brahmini bull system (*Ray*) 22,674-22,676.
Bullocks, number required for given holding (*Roy*) 24,546.
————, smallness of, an obstacle to use of improved implements (*Finlow*) (10).
————, thought by cultivators to be too small for improved implements (*Finlow*) (11), 18,788, 18,789.
Bulls, arrangements for providing (*Finlow*) 17,938, 17,939.
————, demand for, comes chiefly from co-operative societies 17,954.
————————, increasing (*Finlow*) (11).
————, distribution of, to District Boards (*Finlow*) 18,698-18,700, (*Ray*) 22,917-22,919.
————, value of supplying good, to agriculturists (*Momen*) (325).
Cattle-breeding, difficult owing to lack of pastures (*Mukherjee*) 20,391-20,399.
————————, farms for, employment of Veterinary Assistants at (*Kerr*) (101), 19,314-19,320.
————————, need for (*Kerr*) (101).
————————, not carried out in Bengal (*Finlow*) (11), 17,930-17,932, (*Kerr*) 19,229, 19,230, (*Roy*) 24,549.
————————, should remain under Agricultural Dept. (*Kerr*) 19,295.
Cattle cakes (*Kerr*) 19,226-19,228, (*Finlow*) 18,127-18,129.
Cattle Expert, forthcoming appointment of (*Kerr*) (101).
————————, may be under Agricultural or Veterinary Department (*Kerr*) 19,343-19,346.
Cattle farms (*Finlow*) 18,692-18,697, (*Kerr*) (101).
————————, *see also* Ranghpur farm.
Cattle Improvement Committee, suggestion for (*Kerr*) (101).
Cattle in Bengal, bad condition of (*Ray*) (366).
————————, due to land being easily tilled (*Mitra*) (132).

ANIMAL HUSBANDRY—*contd.*

Cattle in Bengal, improvement of, compared with that in England (*Ray*) (365), 22,866-22,873.
————————, large numbers imported annually (*Kerr*) 19,153, 19,158-19,162, 19,325-19,329.
————————, number of, 25 million (*Kerr*) 19,159.
————————, small draft animals preferred (*Kerr*) 19,150, 19,151.
————————, too small (*Kerr*) 19,152.
————————, underfed (*Finlow*) 17,955-17,958 (*Momen*) (325), (*Ahmed M*) (559), 24,605.
Common pastures, *see* Pastures.
Condition of country in rains and cost of feeding, prevent the keeping of good cattle (*Morgan*) (273).
Co-operative agricultural and dairy farm at Ranaghat, scheme for (*Mukherjee*) (179), 20,334-20,337, 20,464-20,469, 20,380-20,382.
Co-operative animal husbandry societies, scope for (*Momen*) 22,193.
Co-operative dairy farms, Government assistance for (*Ray*) 22,920.
Co-operative milk societies, success and work of (*Mitra*) (132).
Co-operative Milk Union, Calcutta, idea of, capable of expansion (*Kerr*) 19,215, 19,271.
————————————, municipal subsidy for (*Kerr*) (98), 19,269, 19,270.
————————————, success of, in inducing owners to take interest in their cattle (*Kerr*) (98).
————————————, work of (*Kerr*) (98), 19,209-19,214, 19,266-19,268, (*Mitra*) (132), 19,888, 19,891.
Cows, food given to (*Roy*) 24,550-24,555.
——, neglect of (*Kerr*) 19,170-19,173, (*Ray*) (365).
——, often too small for good bulls to be used (*Mullick*) 22,658-22,660, (*Peddie*) (430).
Crossing, of Indian breeds (*Kerr*) 19,156, 19,231.
————, with European strains, more liable to disease (*Finlow*) 18,472-18,174.
————————————, valuable only for milk supply (*Finlow*) 17,934-17,936, (*Kerr*) 19,149, 19,235-19,237.
Cultivators, measures necessary to interest, in animal husbandry (*Kerr*) (102).
Dairying, (*Mitra*) (132).
————, almost unknown in Bengal (*Momen*) (326).
————, can be improved by co-operative methods (*Mukherjee*) (179); *see also various headings, commencing* Co-operative.
————, demand for products (*Kerr*) 19,219, 19,220.
————, might be carried out at jails and Government farms (*Kerr*) (101).
————, should be taught by Agricultural Department (*Momen*) (326).
————, training in (*Finlow*) (11).
Dual purpose breed (*Finlow*) 17,933.
European cattle, susceptibility of, to rinderpest (*Kerr*) 19,335-19,338.
Fodder, effect of feeding with, on milk yield (*Kerr*) 19,287-19,294, 19,300-19,302, 19,339-19,341.
————, famines of, not common in Bengal (*Finlow*) 18,026, (*Shebbeare*) 20,633, 20,634.
————, possibility of increasing, by village forests (*Shebbeare*) (207).
————, preservation of, in forest areas, for sale to cultivators (*Shebbeare*) 20,632, 20,635-20,639.
————————————, need for research on (*Finlow*) 17,971, 17,972.
————————————, *see also* Silage.
————, scarcity of, period of (*Finlow*) (11), (*Kerr*) (102), (*Mitra*) (133), (*Momen*) (326), (*Peddie*) (430), (*Burrows*) (474), (*Ahmed U.*) (536), (*Roy*) 24,337-24,339, (*Ahmed, M.*), (559).
————————————, due to cultivators selling their stock owing to high prices (*Mitra*) (133).
————————————, due to transport difficulties (*Ahmed, M.*) (559).

ANIMAL HUSBANDRY—*contd.*

Fodder, supply of, has decreased owing to pressure on land and jute cultivation (*Ray*) (366), 22,679-22,681.
Fodder crops (*Finlow*) (9-11).
————, can be grown on paddy land (*Roy*) 24,342-24,346.
————, demonstrations to popularise (*Momen*) (325), (*Mullick*) 22,664, 22,665, (*Burrows*) (474).
————, fertilisers to increase (*Hutchinson*) (299), 22,069.
————, growing of, as catch crop, should be encouraged (*Ahmed, M.*) (559).
————, can be fitted in with present rotation (*Ahmed, H.*) 20,016-20,020.
————, might be encouraged by remission of revenue (*Finlow*) 17,975-17,978.
————, in winter months, necessary (*Burrows*) (474).
————, need for (*Kerr*) 19,163-19,165, (*Ahmed, H.*) (169), (*Ray*) 22,874-22,878, (*Peddie*) (430).
————, irrigation needed for (*Finlow*) (11), 17,959, 17,960 (*Ahmed, H.*) (242), 21,239-21,241, (*Morgan*) (273), 21,668, (*Roy*), 24,347.
————, must be substituted for grazing (*Finlow*) (11).
————, not grown at present (*Finlow*) 18,124-18,126, (*Bentley*) (242), (*Morgan*) 21,668, (*Mullick*) 22,653, (*Momen*) (325).
————, reservation of land for (*Momen*) (326), (*Ahmed, M.*) (559), 24,606-24,610.
Milk, adulterated, deliberately bought in Calcutta (*Finlow*) 17,942-17,953.
—— and milk products, increased consumption of, would be beneficial (*Bentley*) 21,239.
————, increased production of, impossible without fodder and therefore irrigation (*Bentley*) 21,240, 21,241.
————, supply of in Calcutta, inspection of (*Bentley*) 21,265-21,268.
——, condensed, used for children even in villages (*Ray*) (366), 22,681-22,683.
——, demand for good quality (*Finlow*) 17,937.
——, harm done by lack of (*Ray*) (365, 366), 22,684.
——, legislation for purity, none exists outside Calcutta (*Finlow*) 17,940.
————, valuable but difficult to administer (*Finlow*) 17,941.
————, enforcement of, in Calcutta (*Finlow*) 17,942-17,944.
——, price of, to-day, compared with 55 years ago (*Ray*) 22,682, 22,685-22,687.
————, in rural areas, too high to permit of general consumption (*Bentley*) 21,269-21,273.
——, production of, decreased by underfeeding of cattle (*Ray*) 22,730.
——, scarcity of (*Roy*) 24,348, 24,349.
——, supply of, deteriorating (*Roy*) 24,354.
————, in Calcutta (*Finlow*) 17,942-17,953.
Mustard cake, the giving of, to cattle (*Finlow*) 18,127-18,129.
Ghi, pure, difficult to obtain (*Roy*) 24,350.
Grass-cutting, allowed in all forests (*Shebbeare*) 20,623-20,625.
Grasses grown in forest areas (*Shebbeare*) 20,733.
Grazing, difficulty of, when land is flooded (*Burrows*) (474).
———, forest, a cause of fires (*Shebbeare*) (206, 207), 20,648, 20,649.
————, allowed in some reserved forests (*Shebbeare*) 20,622-20,624, 20,879-20,881.
————, cannot be extended (*Shebbeare*) (206).
————, damage caused by excessive (*Shebbeare*) (206, 207), 20,648, 20,649.
————, many blocks open to, should be closed (*Shebbeare*) (206).
————, method of combating, by stall-feeding (*q.v.*).
————, only affects villages in immediate neighbourhood (*Shebbeare*) 20,885-20,888.
————, should be discouraged (*Shebbeare*) 20,722.

ANIMAL HUSBANDRY—*contd.*

Grazing, in private forests (*Shebbeare*) 20,626.
———, result of cheap, in causing deterioration of cattle (*Shebbeare*) (206), 20,630-20-632.
———, use of bamboos for (*Shebbeare*) 20,739.
———, *see also* Pastures.
Improvement of breeds, by crossing and selection (*Finlow*) (11).
————————, by castration of inferior animals (*Mukherjee*) (179).
————————, by prohibition of slaughter of prime and dry cows (*Mukherjee*) (179), 20,257-20,260.
————————, by provision of better bulls and grazing grounds (*Ahmed, H.*) (170).
————————, importance of (*Finlow*) 17,962, (*Mitra*) 19,455, (*Ahmed, H.*) (170).
————————, suggestions for (*Ahmed, U.*) (536).
Jails, herds kept at, their utilisation for cattle improvement (*Kerr*) (101), 19,234, 19,308-19,310.
——, might be used for dairy work (*Kerr*) (101).
Pastures, common, facilitate spread of disease (*Ahmed U.*) (536).
————————, grazing on, of poor quality (*Finlow*) (11), (*Mitra*) (133).
———————, lack of (*Momen*) (326), (*Peddie*) (429, 430).
————————, overcrowded (*Finlow*) (11), (*Momen*) (326), (*Ahmed M.*) (559), (*Mitra*) (133), (*Peddie*) (430).
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CHATTERJEE, Rai Bahadur Dr. G. C., Secretary, Central Co-operative Anti-Malaria Society (225-227), 20,921-21,145.

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CHAUDHURI, Mr. P. C., Deputy Director of Sericulture (119-123), 19,347-19,392.

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————, should be made known to cultivators 21,519-21,526, 21,765-21,777.

————, time of issue of 21,687.

Middlemen, margins on which they operate 21,501, 21,502, 21,594-21,600, 21,655-21,657, 21,758-21,760.

————, possibility of eliminating 21,752-21,754.

————, transport difficulties a cause of large numbers of 21,753.

Moneylenders, have lien on crop if they advance money against it 21,491-21,494.

Paikars, *see* Farias.

Pressing of jute, done at godowns 21,504, 21,509, 21,510, 21,584.

Quality of jute required for Dundee and Calcutta mills 21,675-21,677.

Regulation of quantity of jute produced through better dissemination of market intelligence 21,713.

Speculation in jute, 21,528, 21,604-21,606.

————————, Bill to prevent, withdrawn 21,797, 21,798.

Stable supply of jute, desirability of 21,526.

————————, lack of, harm done by 21,519, 21,526, 21,618-21,620.

————————, lack of, more pronounced than formerly 21,527-21,529.

Substitutes for jute, not a serious menace 21,684-21,686.

Weights and measures, standardisation of 21,710.

————————, variations in 21,708, 21,709.

MORGAN, Mr. G.—*contd.*

SOILS :

Jute land, large proportion of, is covered with silt and does not require fertilisers 21,479, 21,480, 21,649-21,654.
————, is not deteriorating 21,615-21,617.
Soil analyses, necessity for 21,669.

STATISTICS :

Cadastral survey, necessary to secure accurate agricultural statistics (274), 21,623-21,625.
Crop returns, fairly accurate 21,621, 21,622.
Jute forecasts, *see under* MARKETING.

TARIFFS :

Jute cess, amount of 21,781-21,785.
————, possibility of increasing 21,784.

WELFARE :

Economic surveys of villages, desirable 21,518.
Malaria, not necessarily associated with jute cultivation 21,788-21,790.
Sanitary conditions in up-country towns, good 21,530-21,532.
Sweepers, in towns, mainly come from outside Bengal 21,533-21,539.
————, not found in villages 21,540.
Water supply, tanks for 21,517, 21,518.

MUKHERJEE, Babu N. N., Secretary, Ranaghat Central Co-operative Bank (176-181), 20,076-20,606.

ADMINISTRATION :

Agricultural Department, subordinate staff of, requires increasing (177), 20,077-20,080, 20,226-20,233.
District Boards, revenue of 20,146-20,155, 20,177-20,185, 20,212-20,215.
Roads, bridging of 20,186-20,190.
————, improvement of, will have good effect on agricultural, economic and sanitary conditions (177, 181), 20,109-20,118.
————————, financing of, by means of tolls (181), 20,118-20,133, 20,309-20,315, 20,529-20,532.
————————, must go hand in hand with improvement of education 20,117.
Rural development, financing of 20,118-20,155, 20,177-20,185, 20,212-20,215, 20,309-20,315, 20,318-20,326, 20,400-20,405, 20,529-20,532, 20,545-20,576.

AGRICULTURAL INDEBTEDNESS :

Agricultural income of Bengal, is decreasing 20,540-20,544.
Availability of money, not a cause of borrowing 20,504-20,507.
Causes of borrowing (177).
Control of credit of cultivators, undesirable (177).
Dishonest accounting by moneylenders, not common 20,508, 20,509.
Farming, difficulty of making money by (176), 20,246-20,252, 20,344-20,373 (*on farm owned by witness*).
Litigation as a cause of debt (177), 20,446-20,450.
Medical charges as a cause of debt (177), 20,279-20,282.
Reasons preventing repayment (177).
Rural indebtedness, special measures for, unnecessary (177).

AGRICULTURAL INDUSTRIES :

Cultivators, need for instruction of, in subsidiary industries (179).
————, number of days worked by, about 300 a year (179), 20,470-20,472.
Industries on co-operative or joint-stock basis should be established in rural areas (179).
Obstacles to subsidiary industries (179).

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AGRICULTURAL LABOUR :

Cultivable uncultivated land, suggestions for colonising (180).
Shortage of labour, due to prevalence of malaria (180).
Wage rates for labourers 20,586-20,595.

ANIMAL HUSBANDRY :

Cattle-breeding, difficult owing to lack of pastures 20,391-20,399.
Co-operative agricultural and dairy farm at Ranaghat, scheme for (179), 20,334-20,337, 20,464-20,469, 20,380-20,382.
Dairy industry, can be improved by co-operative methods (179).
Improvement of cattle, by castration of inferior animals (179).
————————, by growing of fodder crops (179).
————————, by prohibition of slaughter of prime and dry cows (179), 20,257-20,260.
Zamindars, should be compelled to set aside land for grazing (179), 20,294-20,299.

ATTRACTING CAPITAL :

Farming, difficulty of making money by, *see under* AGRICULTURAL INDEBTEDNESS.
Government, might guarantee interest on capital to encourage capitalists to take to agriculture (180).
Tenancy Act, prevents investment of money in land improvement (180), 20,301-20,308.

CO-OPERATION :

Bengal Co-operative Organisation Society, State aid for (180), 20,473-20,476.
Central Bank, Ranaghat, capital of 20,418-20,420.
————————, deposits in, 20,421-20,427.
————————, have to be refused on account of surplus 20,426.
————————, directors of 20,430-20,432.
————————, meetings of, are attended by members of primary societies 20,521-20,524.
————————, conducted in vernacular 20,525-20,527.
————————, primary societies under 20,428, 20,429.
Central Banks, use of, for seed distribution (178).
Consolidation, co-operative (177).
Co-operative agricultural and dairy farm at Ranaghat, scheme for (179), 20,334-20,337, 20,464-20,469, 20,380-20,382.
Co-operative Department, staff of, should be increased (180).
Credit societies, interest charged by 20,451-20,453.
————————, use of, for seed distribution (178).
Government, role of, towards co-operative movement (180), 20,485.
Legislative Council, seats on, should be allotted to representatives of co-operative movement (180).
Non-credit societies, value of (180).
Seed and manure stores, co-operative, value of (178).
————————, one should be provided for each Union Board area (178).

CROPS :

Central banks and primary societies, use of, for seed distribution (178).
Co-operative seed and manure stores, value of (178).
————————, one should be provided for each Union Board area (178).
Improvement of existing crops, factors for (178).
Jute, increased yield due to introduction of improved 20,156-20,165.
New crops, introduction of (178), 20,383-20,388.
Potato cultivation, extending 20,387, 20,388.
Seed distribution, co-operative (178).
————————, need for care in, since failure shakes faith of cultivators (178).

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CROPS—*contd.*

Seed distribution, of *charanak* paddy, failed in 1925 (177), 20,081-20,089, 20,166-20,174.

————————, of jute, partially failed in 1926 20,328-20,333, 20,410-20,417.

CULTIVATION:

Hiring out of improved implements, would improve cultivation (178).

DEMONSTRATION AND PROPAGANDA:

Cultivators, conservatism of, due to ignorance and illiteracy (177), 20,443-20,445.

Demonstrations, conditions for success of (176, 177).

————————, examples of success of (177).

————————, of scientific methods of production and conversion of raw material into finished products, need for (176), 20,374-20,379.

————————, on cultivators' own holdings, with guarantee against loss 20,406-20,409.

Demonstrators, importance of increasing number of 20,077-20,080.

————————, one needed for each thana 20,226-20,233.

————————, training necessary for 20,234-20,245, 20,600-20,606.

Middle-class youths, suggestions for interesting, in agriculture, *see under* EDUCATION.

Union Board secretaries, might act as demonstrators 20,327.

EDUCATION:

Adult education, need for night schools for (176), 20,500, 20,501.

Agricultural education, generally sought with view of Government service (176).

————————, lack of facilities for (176), 20,339-20,342.

————————, need for practical (176).

Compulsory primary education, need for (180).

————————, not introduced for financial reasons 20,134-20,145, 20,153-20,155.

Education, method of financing 20,145-20,155, 20,321, 20,322, 20,567-20,570.

————————, the panacea for most evils (181).

Middle-class youths, agricultural ventures by, have failed (176), 20,441, 20,442.

————————, can be interested in agriculture by proof that it will pay (176), 20,340-20,348, 20,366-20,373.

————————, other suggestions for interesting (176), 20,374-20,379.

Night schools, *see* Adult education.

Teachers in rural areas, cannot at present be drawn from agricultural classes (176).

FERTILISERS:

Co-operative seed and manure stores, value of (178).

————————, one should be provided for each Union Board area (178).

Cowdung as fuel, use of, may be checked by offering high price for (178), 20,253, 20,254.

————————, and by making other fuels available more cheaply (178), 20,577-20,580.

Cultivators, methods of encouraging, to use fertilisers (178).

FINANCE:

Agricultural and Industrial Banks, need for establishing 20,486-20,499.

Agricultural and Sanitary Improvements Act, complexity of, hinders use (177), 20,283-20,288.

Land mortgage banks, should be established with liberal financial help from Government (177).

Long term loans, provisions of Bengal Tenancy Act an obstacle to (177).

————————, should be provided by land mortgage banks (177).

Short term loans, should be provided by co-operative societies (177).

MUKHERJEE, Babu N. N.—*contd.*

HOLDINGS :
Consolidation, difficulties of (177).
————————, value of skilled propaganda for 20,513-20,515.
Co-operative consolidation societies, need for (177).
Legislation, should be avoided if possible (177).
Union Boards, should have authority to make consolidations binding for several years with consent of majority (177), 20,090-20,098.

IMPLEMENTS :
Demonstrations of improved implements, need for (178).
Depots for improved implements, need for (178).
Hiring of improved implements, value of (178).

IRRIGATION :
Scope for irrigation (177).

MARKETING :
Information on market conditions, should be afforded to jute cultivators (181), 20,104-20,108.

VETERINARY :
Contagious diseases, obstacles to dealing with (178, 179).
Dispensaries (178).
Inoculation, obstacles to popularising (179).
Serum, free supply of, necessary (179).
Veterinary Department, should be under Director of Agriculture (178), 20,099-20,103.

WELFARE :
Drinking water, at present obtained from tanks and wells 20,193, 20,194.
———— ————, importance of pure (181).
————————, precautions taken to ensure purity 20,195-20,206.
Malaria, prevalence of, leads to shortage of labour (180).
Medical and educational facilities, lack of, and bad communications, responsible for drift to towns (181).
Rural development, financing of, *see under* ADMINISTRATION.
Sanitary conditions in rural areas, improvement of (181).
————————————————, money spent by District Boards on improvement of 20,209-20,211.

MULLICK, R. B. K. N., Ranaghat (349-352), 22445-22672.

ADMINISTRATION :
Board of Agriculture, Bengal, not yet functioning 22,508-22,515.
Central institution for research, need for (349, 350).
Meteorological information, summaries of, might be published in rural areas (350).
Railways and steamers, should give better facilities for agricultural produce and provide cold storage (350).
Roads, need for improvement of (350).
Scientific staff of Government of India, should be increased (550).

AGRICULTURAL INDEBTEDNESS :
Causes of indebtedness (350).
Moneylenders, the chief source of credit (350).
Occupancy rights of cultivators 22,503-22,507.
Reasons preventing repayment (350).
Standard of living, increase in, harmful because due to borrowing (350), 22,619-22,621a.

AGRICULTURAL INDUSTRIES :
Cottage industries, cannot be reorganised on bigger scale (351), 22,465, 22,466.
Cultivators, are confined to bed for 60 to 90 days a year through illness (351), 22,457-22,461, 22,483, 22,484.
Future of spare-time industries, doubtful owing to industrial competition (351), 22,462-22,464.
Industrialisation of rural areas, undesirable (351).
Spinning and weaving 22,470-22,482.

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AGRICULTURAL LABOUR.

Migration of labour, local 22,485-22,495.
Shortage of labour, sometimes due to malaria (352).
————————, usually temporary and due to migration (352), 22,467.

ANIMAL HUSBANDRY:

Cows in Bengal, sometimes too small to allow good bulls to be used 22,658-22,660.
Fodder crops, importance of demonstrations to secure growing of 22,664, 22,665.
————————, not generally grown 22,653.
Silos, construction of 22,668-22,672.

ATTRACTING CAPITAL:

Agriculture, will attract capital if found to be paying (352).

CO-OPERATION:

Compulsion of obstinate minorities, undesirable and should be avoided by compensation (352), 22,468, 22,469.
Non-credit societies, need for developing (352).

CROPS:

Cost of cultivation and return from sugarcane and paddy (363, 364), 22,627-22,633.
Gun licences, should be granted more freely (351).
Hybridisation, possibilities of, not yet explored (351).
Seed distribution, when seed comes from department, satisfactory; when from middlemen contains admixture of inferior seed 22,519, 22,520.
————————, need for better organisation of (351).
Sugarcane cultivation, handicaps to extension of 22,610.
————————, more profitable than jute or paddy 22,606-22,609.

CULTIVATION:

Present methods of cultivation, the result of centuries of experience and investigation (351).
Rotations 22,576-22,578.

DEMONSTRATION AND PROPAGANDA:

Cultivators, will adopt expert advice if given more energetically than at present (349).
Demonstration farm, need for small commercial, near Calcutta, to demonstrate that agriculture can be made to pay 22,641-22,646.
Demonstrations in Ranaghat district 22,546-22,574, 22,581.
Demonstrations on cultivators' own holdings, should be with guarantee against loss (349).

EDUCATION:

Agricultural education, demand for, depends on agriculture becoming profitable 22,542, 22,543.
Agricultural students, may be encouraged by grants of khas lands and loans (349), 22,446-22,451.
Chinsura agricultural school, failure of, due to apathy 22,538-22,542.
Middle class youths, may take to agriculture with Government help. 22,495-22,499.
School farms and plots, valuable (349).

FERTILISERS:

Cowdung, difficult to stop use as fuel (351).
————————, insufficient available for fertiliser (350).
Green manuring (351).
Organic manures, need for increased use of (351).
Soil in Bengal, requires more organic matter (350).

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FINANCE:

Taccavi, amount available of, insignificant compared with vastness of country (350), 22,452, 22,453.

HOLDINGS:

Consolidation, of doubtful value as tending to extinguish peasant proprietor class (350), 22,622-22,626, 22,634.
Litigation, artificial checks to, undesirable (350).
Occupancy rights of cultivators 22,503-22,507.

IMPLEMENTS:

Foreign implements, of no value in Bengal (351).
Loans for purchase of machinery, may be useful (351).
Tractors, replacement of bullocks by 22,649-22,651.
———, scope for 22,651.

IRRIGATION:

Irrigation schemes, scope for and obstacles to (350).
———, demand for, increasing 22,454-22,456.

MARKETING:

Market and crop statistics, in Bengal, are inaccurate and should be corrected or stopped (352).
———, of little service to cultivators (352).
Middlemen, cause undue disturbance in crop market (352).

RESEARCH:

Fodder, need for research on (349).
Water requirements of crops, need for research on (349).

SOILS:

Soil in Bengal, requires more organic matter (350).

STATISTICS:

Agricultural statistics, need for improvement of (352).
Foreign demands for Indian raw material, publication of (352).

OATEN, Mr. E. F., M.A., I.E.S., M.L.C., Director of Public Instruction (452-454), (469, 470), 23,443-23,652.

EDUCATION:

Adult education, female, *see* Female education.
———, hindered by lack of money 23,465.
———, importance of 23,464.
———, note on (*Appendix*) (469, 470).
———, value of, for preventing lapse into illiteracy of children 23,466-23,469.
Agricultural bias in education, not incompatible with attainment of literacy 23,446, 23,447.
Agricultural graduates, lack of openings for 23,470-23,473, 23,556.
Calcutta University Commission, proposals of, for higher agricultural education (453, 454).
Child labour, demand for, a hindrance to education (454), 23,536, 23,537.
———, may be met by adjustment of school hours 23,538-23,540.
Compulsory primary education in rural areas, cess for 23,510-23,513, 23,557-23,559, 23,601, 23,608, 23,609.
———, demand for 23,509, 23,510, 23,572.
———, legislation for, scope of and finance available, 23,478, 23,479, 23,497-23,504.

OATEN, Mr. E. F.—*contd.*

EDUCATION—*contd.*

Compulsory primary education in rural areas, premature withdrawal of children under, means waste of public money 23,480-23,482.

————————————————, suggestion for contracting-in by parents 23,483-23,486, 23,619.

Co-operative Department, co-operation with, in education matters 23,620-23,622.

District school committees, Government grants for 23,639-23,648.

————————————, staff and functions for 23,579-23,589.

Educational advancement, essential for agricultural improvement 23,445.

Educational survey of Bengal, need for 23,575-23,577.

Examination at end of primary course, to prevent children leaving earlier, need for (454), 23,632-23,634.

Expenditure on education, figures for 23,497-23,504, 23,604-23,607.

————————————, in Bengal, compared with other Provinces 23,560, 23,561.

————————————, on higher education, cannot be diverted to primary 23,552.

————————————, on higher education, disproportionately high 23,506-23,509, 23,548-23,551.

Female education, adult 23,545, 23,547.

————————————, compulsory 23,565.

————————————, difficulties and importance of 23,460, 23,546.

————————————, inspectresses for 23,493-23,496.

————————————, lack of demand for 23,543-23,545.

————————————, teachers for 23,461-23,463.

Guru training schools, 23,595-23,597.

————————————, pupils at, might be taken over by Government farms 23,649-23,652.

————————————, numbers of 23,487-23,489.

Higher education system in Bengal, unrelated to rural economy (454).

Inspecting staff, for female education, *see* Female education.

————————————, not selected from agricultural classes 23,615, 23,616.

————————————, qualifications of 23,598.

————————————, should have some acquaintence with agriculture (454).

Literacy, lapse from, owing to lack of reading matter 23,524-23,526.

————————————, tendency of, to unsettle boys for the land 23,532-23,535.

————————————, the primary aim of education 23,446.

————————————, value of, to agriculture 23,527-23-531.

Moga type schools, value of 23,624-23,627.

Nature study, instruction of teachers in 23,451, 23,452.

————————————, teaching of, a special art 23,449, 23,450.

————————————, value of (454).

Normal schools, numbers of 23,487-23,489, 23,491.

Primary education, adequate finance for, the first essential (452).

————————————————————, will be well repaid (452), 23,519, 23,520.

————————————, concentration of, in fewer schools 23,568, 23,573, 23,574.

————————————, curricula (452), 23,599, 23,600.

————————————, grants in aid for, system of, defective 23,592-23,594.

————————————, need for efficient (453).

————————————, objection of upper classes to 23,555.

————————————, pupils at, figures showing numbers leaving before completing education (454).

————————————————, less than 5 per cent. of, attain literacy 23,521-23,523, 23,616-23,618.

————————————, system for, lack of (452).

————————————, *see also* Expenditure on education.

OATEN, Mr. E. F.—*contd.*

EDUCATION—*contd.*

Rural economics, degree in, should be given at Universities 23,492.
————, training in, not given to teachers 23,623.
School farms, expense of, generally prohibitive 23,455.
————, management of, difficult 23,456.
School gardens, value of (454), 23,448.
Secondary school system, agricultural training in, as "practical arts" subject (454).
————, practical (453).
————, vocational (453), 23,458, 23,459.
————, examination standards for, have declined and should be raised 23,474-23,477.
————, has become inadequate (452, 453).
————, in rural areas, should be brought into relation with life of country (453).
————, suggestions for improving (453).
————, teachers, securing living wage for, the first essential (453).
————, training of 23,490.
Teachers, better type of, would tend to keep children at school 23,610-23,614.
————, calibre of, at Guru training schools, low 23,453.
————, do not form part of village life 23,517, 23,518.
————, for agricultural bias schools, will take long time to train 23,457.
————, female, paid higher than male 23,635-23,637.
————, not at present drawn from agricultural classes 23,602, 23,603.
————, salaries of, poor 23,454, 23,514.
————, *see also* Female education *and* Secondary school system.

PEDDIE, Mr. J., I.C.S., Magistrate Collector, Malda (423-442), 23,279-23,442.

ADMINISTRATION:

Railways and steamer facilities, adequate (425).
Road Board, need for provincial (425).
Roads, bad condition of, under District Boards, due to lack of money (425), 23,298.
————, need for extra taxation (such as cart tax) to improve (425), 23,299, 23,300, 23,429, 23,430.

AGRICULTURAL INDEBTEDNESS:

Causes of borrowing (425, 426).
Courts, often inaccessible to poorer classes (426, 427).
Interest charged by moneylenders, excessive (426, 427).
————, may be reduced by activities of credit societies 23,309, 23,310.
————, should be limited (427).
Land, is passing out of hands of real cultivators (426), 23,301.
——, effect of this on cultivation 23,302-23,306, 23,316.
Moneylenders, are in many areas the only source of credit (426).
————, dishonest accounting by 23,436; prevention of 23,437-23,440.
————, interest charged by, *see* Interest.
————, large numbers of "amateur" 23,442.
————, need for more control of, by licensing and inspection (427), 23,349-23,354, 23,437-23,441.
————, numbers and capital of, increasing 23,434, 23,435.
Mortgage and sale, right of, should not be limited (427).
Non-terminable mortgages, should be prohibited (427).
Primary education and social reforms, need for, to lighten burden of debt (426).
Usurious Loans Act, provisions of, too vague (427), 23,307.
————, should be more rigorously enforced (427), 23,367-23,383.

PEDDIE, Mr. J.—*contd.*

AGRICULTURAL INDUSTRIES:

Cultivators, have ample time for subsidiary industries (430).
Factories, difficult to establish in rural areas owing to bad communications (431).
Government, role of, in regard to subsidiary occupations (430).
Industrial unions and sale and purchase societies, need for starting (431).
Investigation of possibilities of rural industries, need for (431).
Necessity for subsidiary industries, should be taught in schools (430).
Non-official help, essential for subsidiary industries (430).
Obstacles to subsidiary industries (430).
Sericulture, average income from 23,339.
————, note on (*Appendix*) (435-442), 23,280-23,284, 23,340.
————, should be made whole-time occupation where possible 23,344, 23,345.

AGRICULTURAL LABOUR:

Migration, confined to wandering tribes 23,387-23,395.

ANIMAL HUSBANDRY:

Cows, often too small for good bulls to be of use (430).
Fodder, need for growing (430).
————, scarcity of (430).
Pasture lands, lack of (429, 430).
————, overstocking of available (430).
Silage, need for development of (430).

ATTRACTING CAPITAL:

Men of capital and enterprise, methods of inducing, to invest money in agriculture (433).
Moneylending, profits from, too large to attract capital to land improvement (433).
Owners of land, need for educating (433).
————, take little interest in land improvement (433).

CO-OPERATION:

Agricultural co-operative inspectors, in close touch with Agricultural Department, need for, to form and supervise agricultural co-operative societies (432).
Agricultural unions for financing co-operative societies, need for (431).
Central Banks, often become dividend-earning machines (431).
————, should undertake seed supply work, &c. (431).
Compulsion of obstinate minorities, need for (432).
Co-operative movement, chiefly confined to credit societies (431).
————, lack of public demand for extension of (431).
Credit societies, failure of, due to lack of supervision (431, 432).
Development Department, need for, to co-ordinate work of agricultural, co-operative and industrial officers (432).
Government, must lead the way in development of co-operative movement (431).
Joint farming societies, not possible at present (432).
Membership of co-operative societies limited to well-to-do cultivators (432).
Provincial Agricultural Federation, need for, to accelerate spread of co-operation (432).
Purchase and sale societies, scope for (432).

CROPS:

Improvement of existing crops, suggestions for (429).
————, successful, examples of (429).
New crops, suggestions for (429).
Seed distribution, cannot be done by Agricultural Department unaided (429).
————, co-operative (431).
————, non-official registered and supervised seed farms for, need for (429).

PEDDIE, Mr. J.—*contd.*

DEMONSTRATION AND PROPAGANDA:

Agricultural Associations, need for, in each Union Board area (424), 23,293-23-297.
Agricultural Department, difficulties due to lack of staff of (424), 23,292.
Circle officers, agricultural training for 23,418.
————————, should interest themselves in agricultural development (424), 23,415-23,417.
Cultivators, necessity for getting into close touch with (425).
————, will adopt improvements showing financial return (425).
Demonstration farms, must be run on economic basis, possibly with non-official help (423).
————————, suspected by cultivators 23,291.
Demonstrations on cultivators' own fields, difficulty of obtaining consent for 23,289, 23290.
District officers, agricultural propaganda by (424).
Field demonstrations, value of (423, 424).
Seed, policy of distributing improved, to large number of individuals in one area, success of (423, 424).

EDUCATION:

Adult education, classes for, might be held in conjunction with Middle English schools (423).
————————, requires non-official help (423).
Child labour, demand for, interferes with education (432, 433).
Compulsory education, proposed legislation for, in Bengal (423, 432).
Fines for absence, deter parents from keeping children at school (433).
Government service, the main inducement to study agriculture (423).
Higher education, at present does nothing to raise agricultural efficiency (432).
Middle-class youths, can be attracted to agriculture by proof that it will pay (423).
School farms, advantages of, compared with plots (423), 23,285-23,387.
————————, financing of (423).
Teachers in rural areas, should be drawn where possible from agricultural classes (423).
Teaching facilities, scope for extension of (423).

FINANCE:

Agriculturists Loans Act, grants under, should be made to subserve propaganda programme of Agricultural Department (425), 23,419-23,423, 23,431-23,433.
————————————, practically a dead letter (425).
Co-operative societies, the best means of financing cultivators (425).
Taccavi, might be used to greater extent (425).

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GLOSSARY

Abwab ..	.. Illegal addition to rent demanded by a superior from an inferior holder of land.
Adhi ..	.. Half produce rent (the share of the produce of landlord and tenant is half and half).
Adhidar ..	.. One who cultivates on a yearly agreement giving half the crop to his landlord.
Ails ..	.. Boundaries of fields.
Aman (paddy)	.. Main rice crop ripening in December.
Amlas ..	.. Clerks (especially zamindar's clerks).
Aratdar ..	.. Seller of commodities on behalf of the growers and of middlemen with godowns for hire for storage of goods.
Arath (arat)	.. Godown ; place where goods are stored and sold.
Aus (paddy)	.. Variety of rice crop ripening in September.
Babu ..	.. An educated man.
Barga (*see* Adhi)	
Barind ..	.. A tract of high land extending through certain districts in the north of Bengal.
Benami ..	.. Transaction in the name of another.
Bepari ..	.. Dealer or commission agent (according as to whether he buys with his own or with borrowed money from an aratdar or financier,—Mahajan, Marwari, etc.)
Bersati or Bursati	.. Disease of horses. Name given to a particular diseased condition of the skin and sub-cutaneous tissues of Equines. It gives rise to the formation of fibrous tumours and ulceration of the overlying skin.
Bhadra ..	.. 5th Bengali month (August-September).
Bhadralog	.. Gentlemen.
Bhil (Bil)	.. Depression more or less permanently covered with water.
Bigha ..	.. One-third of one acre.
Birti ..	.. (1) A small percentage of sale money contributed to a religious fund generally (say one or half a pice in the rupee). (2) A rent free grant (in origin for religious purposes, usually permanent and transferable, despite the purpose to which it may be put).
Boro (paddy)	.. A variety of rice transplanted in January from nurseries and harvested in March. Grown in marshy land.
Bund ..	.. Embankment or dam ; also the water reservoir created by the dam.
Char lands	.. Lands recently thrown up by river or sea.
Charka ..	.. Indigenous spinning wheel.
Chowkidar	.. Village watchman.
Chowkidari rates	.. Tax levied on villages to defray the cost of the maintenance of village watchman.
Chowkidari Union	.. A local board consisting of representatives of a group of village, in a particular area formed under the Bengal Chowkidari Act.
Chowkidari year	.. Equivalent to a Bengali year (beginning from mid-April).
Dadans ..	.. Advances (to cultivators from brokers against standing crops).
Dafadar ..	.. Supervisor of Chowkidars.
Dai ..	.. Midwife.
Dal ..	.. A generic term for food pulses.
Dalal ..	.. Broker.
Damdopat	.. An ancient Hindu provision by which the total interest on a loan may not exceed the amount of the principal.
Danga ..	.. High arable land.
Darpatnidar	.. Holder of land from the Patnidar (q. v.)
Deshi ..	.. Native to the country ; indigenous.
Dhulta ..	.. Dryage allowance.
Diara ..	.. Alluvial formations.
Doctorkhana	.. A dispensary.

Dofasli lands	.. Twice cropped lands.
Done ..	.. A pan used for lifting water from a tank or river. (It is common in West Bengal.)
Dudsar (paddy)	.. A variety of fine rice.
Faria ..	.. A small dealer.
Ganja ..	.. Preparation of hemp and an intoxicating drug.
Gowalas or Goalas	.. Milkmen.
Gur ..	.. Unrefined Indian sugar.
Guru ..	.. A teacher, especially a religious teacher.
Hakim ..	.. A practitioner of the Unani system of medicine (Vaid). Also landlord or Magistrate or Judge.
Halot ..	.. Patch (village highway broader than a path) (East Bengal).
Hát ..	.. Market (held on fixed days in a week).
Hundi ..	.. A promissory note.
Indrasail	.. A variety of paddy.
Izardar ..	.. Holder of a farming lease.
Jamait land	.. Land appertaining to a tenancy. Generally used of rent paying as distinct from produce paying tenancies.
Jheel (Jhil)	.. A lake.
Jhuming	.. Temporary cultivation in jungle clearings.
Jotdars ..	.. Tenants, cultivators, etc.
Juar ..	.. The large millet. (*Sorghum vulgare.*)
Kakia bombai	.. A variety of jute.
Kala-azar	.. A kind of persistent and malignant fever (Leishman—Donovan infection)—(not black water fever).
Kalai ..	.. A variety of pulse (dal).
Kamat ..	.. Proprietor's private land—also called khamar or nij-jote.
Kataktara (aus)	.. A variety of rice.
Khaddar	.. Home-made cloth.
Khal ..	.. A water channel or stream, sometimes an artificial water course.
Khana ..	.. Place, only used in combination, *e.g.*, daftarkhana—place of office.
Kharif ..	.. Summer-sown (crops).
Khas mahals	.. Estates owned and managed direct by Government.
Khesari ..	.. A variety of pulse (dal). (*Lathyrus sativus.*)
Kist ..	.. Instalment of rent or revenue.
Koyal ..	.. Weighman.
Kutcha (Kacha)	.. Literally "not solid" and thus an equivalent of "poor quality." (Opposite Pucca.)
Kyah ..	.. Marwari. (A class of merchants and traders coming from Marwar.)
Lakhraj (land)	.. Lands held revenue free (used loosely also for rent-free land).
Mahajan	.. A moneylender.
Maktab schools	.. Mahommedan primary schools for teaching the Koran.
Marwari ..	.. A class of merchants and traders coming from Marwar.
Mashkalai	.. A black variety of pulse (dal).
Mela ..	.. A fair.
Mistri ..	.. A mechanic.
Mutti kabari	.. Staff allowance.
Nazar ..	.. A present to a superior person, generally a zamindar, on a ceremonial occasion or for permission to transfer lands, effect improvements thereon, etc., etc.
Paikar ..	.. A wholesale dealer.
Pan ..	.. Betel leaf.
Paschimwallas	.. Upcountry men.
Pathsala ..	.. A lower primary school.
Patnidar ..	.. A holder of land on permanent lease from a zamindar, the rent being fixed in perpetuity and recoverable by a summary process under a special law.

Patta ..	.. A document of lease.
Poramboke ..	.. Communal grounds for grazing, threshing, etc.
Prodhan ..	.. A village headman.
Pucca ..	.. Solid, ripe.
Pundit ..	.. Teacher.
Rabi ..	.. Winter-sown (crops).
Salami ..	.. Fee payable to a person—generally a zamindar or a landlord—for the recognition of a transaction in property in which he has an interest.
Seer ..	.. Approximately 2 lbs. in weight.
Shepatnidar	.. A holder of land from the darpatnidar (q. v.)
Sowcar ..	.. A money-lender.
Sradh ..	.. A religious ceremony on the termination of the period of mourning.
Taccavi ..	.. Advances made by Government to cultivators for agricultural purposes.
Tahari ..	.. A customary present to zamindar's clerks.
Tahsil ..	.. In Bengal there is no revenue division corresponding to "tahsil" in the Upper Provinces. The word means "collection."
Tahsildars	.. Officers entrusted with collection of rent or revenue.
Taungya ..	.. Temporary cultivation in jungle clearings.
Thana ..	.. Police station—also the area comprised in it.
Toria ..	.. Mustard.
Utbandi tenants	.. Holders of such tenancies.
Utbandi tenures	.. Tenancies in which rent is assessed on the area cultivated each year.
Zamindar	.. A holder of permanently settled land direct from Government.

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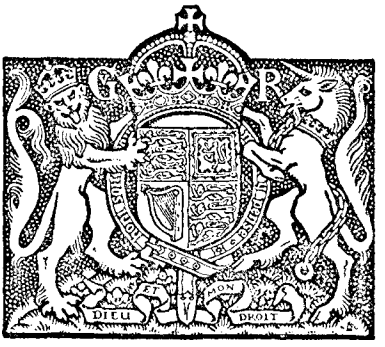

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June, 1927.

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INTERIM REPORT.

To

THE KING'S MOST EXCELLENT MAJESTY.

May It Please Your Majesty,

We, the Commissioners appointed to examine and report on the present conditions of agricultural and rural economy in British India, and to make recommendations for the improvement of agriculture and to promote the welfare and prosperity of the rural population; in particular, to investigate:—(*a*) the measures now being taken for the promotion of agricultural and veterinary research, experiment, demonstration and education, for the compilation of agricultural statistics, for the introduction of new and better crops and for improvement in agricultural practice, dairy farming and the breeding of stock; (*b*) the existing methods of transport and marketing of agricultural produce and stock; (*c*) the methods by which agricultural operations are financed and credit afforded to agriculturists; (*d*) the main factors affecting rural prosperity and the welfare of the agricultural population; and to make recommendations; availing ourselves of Your Majesty's permission to report our proceedings from time to time, desire to submit to Your Majesty the minutes of evidence which we have taken up to the 19th December, 1926, on the subject of our Inquiry.

All of which we most humbly submit for Your Majesty's most gracious consideration.

(Signed) LINLITHGOW,
Chairman.
(„) H. S. LAWRENCE.
(„) T. H. MIDDLETON.
(„) J. MACKENNA.
(„) H. CALVERT.
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(„) L. K. HYDER.
(„) B. S. KAMAT.

(Signed) J. A. MADAN,
(„) F. W. H. SMITH,
Joint Secretaries.

7th June, 1927.

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TERMS OF REFERENCE

Generally,

To examine and report on the present conditions of agriculture and rural economy in British India and to make recommendations for the improvement of agriculture and the promotion of the welfare and prosperity of the rural population;

In particular to investigate—

(*a*) the measures now being taken for the promotion of agricultural and veterinary research, experiment, demonstration and education, for the compilation of agricultural statistics, for the introduction of new and better crops and for improvement in agricultural practice, dairy farming and the breeding of stock;

(*b*) the existing methods of transport and marketing of agricultural produce and stock;

(*c*) the methods by which agricultural operations are financed and credit afforded to agriculturists;

(*d*) the main factors affecting rural prosperity and the welfare of the agricultural population;

and to make recommendations.

It will not be within the scope of the Commission's duties to make recommendations regarding the existing system of landownership and tenancy or of the assessment of land revenue and irrigation charges, or the existing division of functions between the Government of India and the local Governments. But the Commission shall be at liberty to suggest means whereby the activities of the Governments in India may best be co-ordinated and to indicate directions in which the Government of India may usefully supplement the activities of local Governments.

QUESTIONNAIRE

Part I

Question.

1. Research.
2. Agricultural education.
3. Demonstration and propaganda.
4. Administration.
5. Finance.
6. Agricultural indebtedness.
7. Fragmentation of holdings.

Part II

8. Irrigation.
9. Soils.
10. Fertilisers.
11. Crops.
12. Cultivation.
13. Crop protection.
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15. Veterinary.
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Part IV

17. Agricultural industries.
18. Agricultural labour.
19. Forests.
20. Marketing.
21. Tariffs and sea freights.
22. Co-operation.
23. General education.
24. Attracting capital.
25. Welfare of rural population.
26. Statistics.

QUESTIONNAIRE

PART I

1. Research.

(*a*) Have you suggestions to advance for the better organisation, administration and financing of—

(*i*) All research affecting the welfare of the agriculturist, including research into the scientific value of the indigenous theory and traditional methods of agriculture,

(*ii*) Veterinary research ?

(*b*) If in cases known to you progress is not being made because of the want of skilled workers, or field or laboratory facilities for study or by reason of any other handicaps, please give particulars. [Suggestions of a general kind should be made under (*a*) ; answers under this heading should relate to specific subjects. The purpose is to secure a list of the problems met with by scientific investigators in the course of their work which are being held over because of lack of resources or deficient organisation.]

(*c*) Can you suggest any particular subject for research not at present being investigated to which attention might usefully be turned ?

2. Agricultural Education.

With reference to any form of agricultural education of which you may have experience, please state your views on the following :—

(*i*) Is the supply of teachers and institutions sufficient ?

(*ii*) Is there an urgent need for extension of teaching facilities in any district or districts known to you personally ?

(*iii*) Should teachers in rural areas be drawn from the agricultural classes ?

(*iv*) Are the attendances at existing institutions as numerous as you would expect in present circumstances ; if not, state reasons. Can you suggest measures likely to stimulate the demand for instruction ?

(*v*) What are the main incentives which induce lads to study agriculture ?

(*vi*) Are pupils mainly drawn from the agricultural classes ?

(*vii*) Are there any modifications in existing courses of study which appear to be called for ; if so, what are they ?

(*viii*) What are your views upon (*a*) nature study ; (*b*) school plots ; (*c*) school farms ?

(*ix*) What are the careers of the majority of students who have studied agriculture ?

(*x*) How can agriculture be made attractive to middle class youths ?

(*xi*) Are there recent movements for improving the technical knowledge of students who have studied agriculture ?

(*xii*) How can adult education in rural tracts be popularised ?

(*xiii*) In suggesting any scheme for better educational facilities in rural areas, please give your views for (*a*) its administration and (*b*) its finance.

3. Demonstration and Propaganda.

(*a*) What are the measures which in your view have been successful in influencing and improving the practice of cultivators ?

(*b*) Can you make suggestions for increasing the effectiveness of field demonstrations ?

(*c*) Can you suggest methods whereby cultivators may be induced to adopt expert advice ?

(*d*) If you are aware of any striking instances of the success or the failure of demonstration and propaganda work, please give particulars and indicate the reasons for success or for failure.

4. Administration.

(*a*) Do you wish to suggest means towards the better co-ordination of the activities of the Governments in India or to indicate directions in which the Government of India may usefully supplement the activities of the local Governments ?

(*b*) Is it your opinion that the expert scientific knowledge required in the development of agriculture in the different Provinces could be supplied to a greater extent than is the case at present by increasing the scientific staff of the Government of India ? If so, indicate the types of work which would benefit by pooling the services of experts, and suggest how that work should be controlled.

(*c*) Are you satisfied from the agricultural standpoint with the services afforded by—

(*i*) The Agricultural and Veterinary Services,

(*ii*) Railways and steamers,

(*iii*) Roads,

(*iv*) Meteorological Department,

(*v*) Posts, and

(*vi*) Telegraphs, including wireless ?

If not, please indicate directions in which you think these Services might be improved or extended.

5. Finance.

(*a*) What are your views as to the steps that should be taken for the better financing of agricultural operations and for the provision of short and long-term credit to cultivators ?

(*b*) Do you wish to suggest means whereby cultivators may be induced to make fuller use of the Government system of *taccavi* ?

6. Agricultural Indebtedness.

(*a*) What in your opinion are :—

(*i*) the main causes of borrowing,

(*ii*) the sources of credit, and

(*iii*) the reasons preventing repayment.

(*b*) What measures in your opinion are necessary for lightening agriculture's burden of debt ? For example, should special measures be taken to deal with rural insolvency, to enforce the application of the Usurious Loans Act, or to facilitate the redemption of mortgages ?

(*c*) Should measures be taken to restrict or control the credit of cultivators such as limiting the right of mortgage and sale ? Should non-terminable mortgages be prohibited ?

7. Fragmentation of Holdings.

(*a*) Do you wish to suggest means for reducing the loss in agricultural efficiency attendant upon the excessive subdivision of holdings ?

(*b*) What are the obstacles in the way of consolidation and how can they be overcome ?

(*c*) Do you consider legislation to be necessary to deal with minors, widows with life interest, persons legally incapable, alienation and dissentients, and to keep disputes out of the courts ?

PART II

8. Irrigation.

(*a*) Name any district or districts in which you advocate the adoption of new irrigation schemes, or suggest extensions or improvements in the existing systems or methods of irrigation by—

(*i*) Perennial and non-perennial canals,
(*ii*) Tanks and ponds,
(*iii*) Wells.

What are the obstacles in your district or Province to the extension of irrigation by each of the above methods ?

(*b*) Are you satisfied with the existing methods of distributing canal water to cultivators ? Describe the methods that have been employed to prevent wastage of water by evaporation and by absorption in the soil. What form of outlet for distribution to cultivators at the tail end do you regard as the most equitable and economical ? Have these methods and devices been successful, or do you wish to suggest improvements ?

(*N.B.*—Irrigation charges are *not* within the terms of reference of the Commission, and should not be commented upon.)

9. Soils.

(*a*) Have you suggestions to make—

(*i*) for the improvement of soils, whether by drainage or other means, not dealt with under other headings in this questionnaire.
(*ii*) for the reclamation of Alkali (Usar) or other uncultivable land,
(*iii*) for the prevention of the erosion of the surface soil by flood water ?

(*b*) Can you give instances of soils known to you which, within your recollection, have—

(*i*) undergone marked improvement,
(*ii*) suffered marked deterioration ?

If so, please give full particulars.

(*c*) What measures should Government take to encourage the reclamation of areas of cultivable land which have gone out of cultivation ?

10. Fertilisers.

(*a*) In your opinion, could greater use be profitably made of natural manures or artificial fertilisers ? If so, please indicate the directions in which you think improvement possible.

(*b*) Can you suggest measures to prevent the fraudulent adulteration of fertilisers ?

(*c*) What methods would you employ to popularise new and improved fertilisers ?

(*d*) Mention any localities known to you in which a considerable increase in the use of manures has recently taken place.

(*e*) Has effect of manuring with phosphates, nitrates, sulphate of ammonia, and potash manures been sufficiently investigated ? If so, what is the result of such investigation ?

(*f*) What methods would you employ to discourage the practice of using cowdung as fuel ?

11. Crops.

(*a*) Please give your views on—

(*i*) the improvement of existing crops,

(*ii*) the introduction of new crops including fodder crops,

(*iii*) the distribution of seeds,

(*iv*) the prevention of damage by wild animals.

(*b*) Can you suggest any heavy yielding food crops in replacement of the present crops ?

(*c*) Any successful efforts in improving crops or substituting more profitable crops which have come under your own observation should be mentioned.

12. Cultivation.

Can you suggest improvements in—

(*i*) the existing system of tillage, or

(*ii*) the customary rotations or mixtures of the more important crops ?

13. Crop Protection, Internal and External.

Please give your views on—

(*i*) The efficacy and sufficiency of existing measures for protection of crops from external infection, pests and diseases.

(*ii*) The desirability of adopting internal measures against infection.

14. Implements.

(*a*) Have you any suggestion for the improvement of existing, or the introduction of new, agricultural implements and machinery ?

(*b*) What steps do you think may usefully be taken to hasten the adoption by the cultivator of improved implements ?

(*c*) Are there any difficulties which manufacturers have to contend with in the production of agricultural implements or their distribution for sale throughout the country ? If so, can you suggest means by which these difficulties may be removed ?

PART III

15. Veterinary.

(*a*) Should the Civil Veterinary Department be under the Director of Agriculture or should it be independent ?

(*b*) (*i*) Are dispensaries under the control of Local (District) Boards ? Does this system work well ?

(*ii*) Is the need for expansion being adequately met ?

(*iii*) Would you advocate the transfer of control to Provincial authority ?

(*c*) (*i*) Do agriculturists make full use of the veterinary dispensaries ? If not, can you suggest improvements to remedy this ?

(*ii*) Is full use made of touring dispensaries ?

(*d*) What are the obstacles met with in dealing with contagious diseases ? Do you advocate legislation dealing with notification, segregation, disposal of diseased carcases, compulsory inoculation of contacts and prohibition of the movement of animals exposed to infection ? Failing legislation, can you suggest other means of improving existing conditions ?

(*e*) Is there any difficulty in securing sufficient serum to meet the demand ?

(*f*) What are the obstacles in the way of popularising preventive inoculation ? Is any fee charged, and, if so, does this act as a deterrent ?

(*g*) Do you consider that the provision of further facilities for research into animal disease is desirable ?

If so, do you advocate that such further facilities should take the form of—

(*i*) an extension of the Muktesar Institute, or

(*ii*) the setting up, or extension of, Provincial Veterinary Research Institutions ?

(*h*) Do you recommend that special investigations should be conducted by—

(*i*) officers of the Muktesar Institute, or

(*ii*) research officers in the Provinces ?

(*i*) Do you recommend the appointment of a Superior Veterinary Officer with the Government of India ? What advantages do you expect would result from such an appointment ?

16. Animal Husbandry.

(*a*) Do you wish to make suggestions for—

(*i*) improving the breeds of livestock,

(*ii*) the betterment of the dairying industry,

(*iii*) improving existing practice in animal husbandry ?

(*b*) Comment on the following as causes of injury to cattle in your district—

(*i*) Overstocking of common pastures,

(*ii*) Absence of enclosed pastures, such as grass borders in tilled fields,

(*iii*) Insufficiency of dry fodder such as the straw of cereals or the stems and leaves of pulses,

(*iv*) Absence of green fodders in dry seasons,

(*v*) Absence of mineral constituents in fodder and feeding stuffs.

(*c*) Please mention the months of the year in which fodder shortage is most marked in your district. For how many weeks does scarcity of fodder usually exist ? After this period of scarcity ends how many weeks elapse before young growing cattle begin to thrive ?

(*d*) Can you suggest any practicable methods of improving or supplementing the fodder supply that would be applicable to your district ?

(*e*) How can landowners be induced to take a keener practical interest in these matters ?

Part IV

17. Agricultural Industries.

(*a*) Can you give any estimate of the number of days of work done by an average cultivator on his holding during the year ? What does he do in the slack season ?

(*b*) Can you suggest means for encouraging the adoption of subsidiary industries ? Can you suggest any new subsidiary industries to occupy the spare time of the family which could be established with Government aid ?

(*c*) What are the obstacles in the way of expansion of such industries as beekeeping, poultry rearing, fruit growing, sericulture, pisciculture, lac culture, rope making, basket making, etc. ?

(*d*) Do you think that Government should do more to establish industries connected with the preparation of agricultural produce for consumption, such as oil pressing, sugar making, cotton ginning, rice hulling, utilisation of wheat straw for card-board, utilisation of cotton seed for felt, fodder, oil and fuel, utilisation of rice straw for paper, etc. ?

(*e*) Could subsidiary employment be found by encouraging industrial concerns to move to rural areas ? Can you suggest methods ?

(*f*) Do you recommend a more intensive study of each rural industry in its technical, commercial and financial aspects, with a view to, among other things, introduction of improved tools and appliances ?

(*g*) Can you suggest any other measures which might lead to greater rural employment ?

(*h*) Can you suggest means whereby the people could be induced to devote their spare time to improving the health conditions of their own environment ?

18. Agricultural Labour.

(*a*) What measures, if any, should be taken to attract agricultural labour from areas in which there is a surplus to—

(*i*) areas under cultivation in which there is a shortage of such labour ? and

(*ii*) areas in which large tracts of cultivable land remain uncultivated ?

Please distinguish between suggestions designed to relieve seasonal unemployment and proposals for the permanent migration of agricultural population.

(*b*) If there is any shortage of agricultural labour in your Province, what are the causes thereof and how could they be removed ?

(*c*) Can you suggest measures designed to facilitate the occupation and development, by surplus agricultural labour, of areas not at present under cultivation ?

19. Forests.

(*a*) Do you consider that forest lands as such are at present being put to their fullest use for agricultural purposes ? For instance, are grazing facilities granted to the extent compatible with the proper preservation of forest areas ? If not, state the changes or developments in current practice which you consider advisable.

(*b*) Can you suggest means whereby the supply of firewood and fodder in rural areas may be increased ?

(*c*) Has deterioration of forests led to soil erosion ? What remedies would you suggest for erosion and damage from floods ?

(*d*) Can you indicate any methods by which supply of moisture in the soil, the rainfall and supply of canal water can be increased and regulated by afforestation or by the increased protection of forests so as to benefit agriculture ? Would the same methods be useful in preventing the destruction by erosion of agricultural land ?

(*e*) Is there an opening for schemes of afforestation in the neighbourhood of villages ?

(*f*) Are forests suffering deterioration from excessive grazing ? Is soil erosion being thereby facilitated ? Suggest remedies.

20. Marketing.

(*a*) Do you consider existing market facilities to be satisfactory ? Please specify and criticise the markets to which you refer, and make suggestions for their improvement.

(*b*) Are you satisfied with the existing system of marketing and distribution ? If not, please indicate the produce to which you refer and describe and criticise in detail the channels of marketing and distribution from the producer to the consumer in India (or exporter in the case of produce exported overseas). State the services rendered by each intermediary and whether such intermediary acts in the capacity of merchant or commission agent, and comment upon the efficiency of these services and the margins upon which such intermediaries operate. Please describe

the method by which each transaction is financed, or in the case of barter, by which an exchange is effected.

(*c*) Do you wish to suggest steps whereby the quality, purity, grading or packing of agricultural produce may be improved, distinguishing where possible between produce destined for—

(*i*) Indian markets ?

(*ii*) Export markets ?

(*d*) Do you think that more effective steps might be taken to place at the disposal of cultivators, merchants and traders information as to market conditions, whether Indian or overseas ; crop returns ; complaints as to Indian produce from wheresoever originating ; and agricultural and marketing news in general ?

21. Tariffs and Sea Freights.

Do existing (*a*) customs duties, both import and export, and (*b*) sea freights adversely affect the prosperity of the Indian cultivator ? If so, have you any recommendations to make ?

22. Co-operation.

(*a*) What steps do you think should be taken to encourage the growth of the co-operative movement—

(*i*) by Government,

(*ii*) by non-official agencies ?

(*b*) Have you any observations to make upon—

(*i*) Credit societies ;

(*ii*) Purchase societies ;

(*iii*) Societies formed for the sale of produce or stock ;

(*iv*) Societies for effecting improvements—*e.g.*, the digging of wells and the construction of bunds, walls and fences, or the planting of hedges ;

(*v*) Societies formed for the aggregation of fragmented holdings and their redistribution in plots of reasonable size ;

(*vi*) Societies for the co-operative use of agricultural machinery ;

(*vii*) Societies for joint farming ;

(*viii*) Cattle breeding societies ;

(*ix*) Societies formed for any purpose connected with agriculture or with the betterment of village life, but not specified above ?

(*c*) Where co-operative schemes for joint improvement, such as co-operative irrigation or co-operative fencing or a co-operative consolidation of holdings scheme, cannot be given effect to owing to the unwillingness of a small minority to join, do you think legislation should be introduced in order to compel such persons to join for the common benefit of all ?

(*d*) Do you consider that those societies of which you have personal knowledge have, in the main, achieved their object ?

23. General Education.

(*a*) Do you wish to make observations upon existing systems of education in their bearing upon the agricultural efficiency of the people ? If you make suggestions, please distinguish, as far as possible, between—

(*i*) Higher or collegiate,

(*ii*) Middle school, and

(*iii*) Elementary school education.

(*b*) (*i*) Can you suggest any methods whereby rural education may improve the ability and culture of agriculturists of all grades while retaining their interest in the land ?

(*ii*) What is your experience of compulsory education in rural areas ?

(*iii*) What is the explanation of the small proportion of boys in rural primary schools who pass through the fourth class ?

24. Attracting Capital.

(*a*) What steps are necessary in order to induce a larger number of men of capital and enterprise to take to agriculture ?

(*b*) What are the factors tending to discourage owners of agricultural land from carrying out improvements ?

25. Welfare of Rural Population.

(*a*) Outside the subjects enumerated above, have you any suggestions to offer for improving hygiene in rural areas and for the promotion of the general well-being and prosperity of the rural population ?

(*b*) Are you, for instance, in favour of Government conducting economic surveys in typical villages with a view to ascertaining the economic position of the cultivators ? If so, what, in your opinion, should be the scope and methods of such enquiries ?

(*c*) If you have carried out anything in the nature of such intensive enquiry, please state the broad conclusions which you reached.

26. Statistics.

(*a*) Do you wish to make suggestions for the extension or improvement of the existing methods of—

(*i*) ascertaining areas under cultivation and crops ;

(*ii*) estimating the yield of agricultural produce ;

(*iii*) enumerating livestock and implements ;

(*iv*) collecting information on land tenure, the incidence of land revenue and the size of the agricultural population ;

(*v*) arranging and publishing agricultural statistics ?

(*b*) Have you any other suggestions to make under this heading ?

MINUTES OF EVIDENCE

TAKEN BEFORE THE

ROYAL COMMISSION ON AGRICULTURE.

Monday, December 13th, 1926.

SHILLONG.

PRESENT:

The MARQUESS OF LINLITHGOW, D.L. (*Chairman*).

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S.
Sir THOMAS MIDDLETON, K.B.E., C.B.
Sir JAMES MACKENNA, KT., C.I.E., I.C.S.
Mr. H. CALVERT, C.I.E., I.C.S.
Professor N. GANGULEE.
Dr. L. K. HYDER.
Mr. B. S. KAMAT.

Mr. J. HEZLETT, I.C.S.
Rai Bahadur RAMANI MOHAN DAS. } (*Co-opted Members*).

Mr. J. A. MADAN, I.C.S.
Mr. F. W. H. SMITH. } (*Joint Secretaries*).

Rai Bahadur K. L. BARUA, B.L., Director of Agriculture and Industries and Registrar of Co-operative Societies, Assam.

Replies to the Questionnaire.

QUESTION 1.—RESEARCH.—(*a*) (*i*) For better organisation of agricultural scientific research work in Assam we must have an adequate and capable staff. At present the only superior officer in the scientific staff is the Botanist who is a member of the Indian Agricultural Service. The assistants in the chemical and entomological sections are members of the Subordinate Service. We have no mycological expert to study plant diseases.

In my opinion, all research for the welfare of the agriculturists must have a definite practical end in view. It must always be remembered by those engaged in researches that the agriculturists will not give up the indigenous theory or practice of agriculture unless striking improvements are demonstrated in such a way as to leave no room for doubting the value of such improvements. Further, the improvements suggested should

be attainable without much alteration of the methods to which the agriculturists are accustomed and with expenditure of a reasonable amount of labour and money. In other words, the improvements must not be beyond their means. The conservatism of agriculturists throughout India is well known. The task of the department in popularising improvements in a Province like Assam where the pressure on the soil is yet light, the natural fertility of the soil is yet good enough and the climatic conditions are favourable, must necessarily be more up-hill.

(*b*) In my opinion, we should have a Chemist, an Entomologist, a Mycologist and a Livestock Expert, all belonging to the Provincial Service. They should be at least men who have undergone post-graduate training at Pusa. They should hold independent charges of their own sections and not work under the control of the Botanist as at present.

The botanical staff which now consists of the Economic Botanist with two botanical assistants, two field assistants and two field men for the two rice farms is adequate and the only scientific work of any value is being done in this section.

(*c*) The following subjects require to be studied:—

(1) What improved implements are suited to the soil, climate, condition of the draught animals and economic position of the agriculturists in Assam.

(2) What can be done to improve the methods of packing and transit of oranges, pine-apples and potatoes to distant places.

QUESTION 2.—AGRICULTURAL EDUCATION.—(*i*) to (*vii*) There are no institutions in Assam for teaching agriculture. No attempt has yet been made to introduce agricultural education into our elementary or middle schools.

(*viii*) We are trying to teach improved methods to agriculturists by means of ocular demonstrations in their own fields but, in my opinion, this is not enough. We should combine this method with a system of education in the theory and practice of agriculture at least in middle schools. Nature study should certainly form a part of such education. School farms will perhaps be too costly to begin with. I would, therefore, advocate school plots not merely for growing flowers or English vegetables, but for growing some of our important crops such as rice, jute, sugarcane and mustard. Such school plots may be periodically visited by our Agricultural Inspectors and teachers may be made to undergo training for at least one year in our experimental farms as apprentices. Local Boards who are now charged with rural education should maintain such apprentices in our farms with stipends.

(*ix*) We now send students to Agricultural Colleges in other Provinces with stipends and we have to pay per head of such students a monthly contribution to other Provincial Governments. These students after passing out of the college are appointed to the Subordinate Agricultural Service. One or two have started individual private farms of their own.

(*x*) By demonstrating that scientific agriculture is a paying proposition. This will be demonstrated better by the pioneers who are now on the field and we must do all we can to assist them at this stage to make them successful.

(*xi*) There is none in this Province but I should think arrangements should be made for practical training of our officers at Pusa sent on short deputation.

(*xii*) In convenient places, night schools may be established where lantern lectures on co-operation, cattle keeping, dealing with insect pests, etc., may be delivered at least once a week by the local Agricultural Inspector. Greater attention of the departmental staff to agricultural education will necessarily require reduction of each Inspector's area of operation and consequent increase of the number of Inspectors and of the superior staff for supervision.

(*xiii*) (*a*) The administration should certainly rest with the Department of Education though I know there are some people who think that rural education should be made over *en bloc* to the Agricultural Department.

(*b*) The finances should, as at present, be supplied by the Local Boards assisted by Government. A greater portion of money now spent on high education may be profitably diverted to rural education.

R. B. K. L. Barua]

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(*a*) Demonstration in the cultivators' own fields.

(*b*) (*i*) Demonstration farms should be established in each sub-division, (*ii*) District Agricultural Associations should be formed and (*iii*) co-operative demonstration centres may be tried.

(*c*) Educated or middle-class farmers may be expected to follow expert advice and introduce scientific cultivation. If such farmers prove successful their example may be followed by ordinary cultivators. It is, therefore, essentially necessary to assist and encourage such farmers.

(*d*) Departmental seeds of potatoes, paddy and jute have become strikingly popular. Similarly our three-roller surgarcane crushing mill is very popular. Successful introduction of bonemeal as fertiliser of paddy in the hills is another instance.

We introduced sugarcane of high-yielding varieties but subject to depredations of jackals. These were very popular at the beginning owing to high yields, but they are not wanted now as they are an easy prey to jackals.

QUESTION 4.—ADMINISTRATION.—(*a*) & (*b*) I will answer these questions rather generally.

All Provinces have not the same agricultural conditions and the same problems have not to be faced in each Province. Each Province should therefore have its own scientific branch properly developed. The Central Government of India Department may usefully train the officers needed for our Provincial and Subordinate Services at Pusa.

(*c*) (*i*) Yes, but the services should be strengthened.

(*ii*) Further railway development in this Province is urgently needed.

(*iii*) The roads are bad and improvement is very necessary.

(*iv*) This is not important.

(*v*) & (*vi*) Satisfactory.

QUESTION 5.—FINANCE.—(*a*) Extension and strengthening of the co-operative credit movement. The staff of the department should be strengthened and as the officers have to do a lot of missionary work in the villages they should be adequately paid. For long-term credit, land mortgage banks should be started in every district and, in the initial stages, Government should grant loans to such banks on favourable terms for a long period to be repaid by easy instalments.

(*b*) At present only small sums are available for issue of *taccavi* loans in ordinary years. It is true that when serious failures of crops occur, *taccavi* loans are issued more liberally but the affected people regard such loans as gratuitous relief rather than as loans repayable and the result is that a considerable portion of the loans issued has to be written off, and such remissions have a demoralising effect. The co-operative credit movement has failed in localities where large sums of money were issued in *taccavi* loans and remissions were large. As far as possible, *taccavi* loans should be issued only through co-operative societies.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(*a*) (*i*) (1) For financing agricultural operations, purchase of plough-cattle, implements, etc.

(2) For marriages, funeral ceremonies, etc.

(3) Purchase and improvement of land and dwelling houses.

(4) Clearing family debts.

(5) Payment of land revenue or rent.

(*ii*) Village moneylenders, Marwari traders, co-operative societies.

(*iii*) (1) Unproductive use of loans in many cases.

(2) Multiplicity of creditors.

(3) Desire to defraud creditors.

(4) Repayment by instalments is not encouraged by village moneylenders.

(5) Indolence and passive resignation to fate.

R. B. K. L. Barua]

(*b*) Redemption of mortgages should be facilitated by the extension of co-operative mortgage credit which will permit repayment of loans from profits spread over a number of years.

(*c*) I am not in favour of such restriction.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—(*a*) The evil of fragmentation is not, in my opinion, very serious yet in Assam. It is however necessary to begin consolidation now so that the process of sub-division, which will go on, may be countered to some extent. An arresting force will then continue to work.

(*b*) The customary law and usages with regard to inheritance and alienation. It is hardly possible to overcome these obstacles.

(*c*) I do not think that legislation can help much.

QUESTION 10.—FERTILISERS.—(*a*) Yes. Particularly the present waste of natural manures should be stopped. Storage of natural manure in covered pits has been demonstrated but more propaganda is necessary.

(*c*) By field demonstrations in places where a demand for fertilisers has grown up.

(*d*) Khasi Hills where bonemeal is now largely used for manuring terraced rice fields.

(*e*) Not in respect of ordinary village cultivation.

(*f*) Cowdung is rarely used as fuel in Assam.

QUESTION 11.—CROPS.—(*a*) (*i*) Existing crops can be improved by better tillage, manuring and use of better seeds. We are concentrating our efforts in popularising and supplying better seeds.

(*ii*) New crops such as potatoes, ground-nuts and pulses have already been successfully introduced in localities. In the Khasi Hills, potatoes are now extensively grown. In the plains also the cultivation of potato is fast extending. But for damages by wild pigs, the cultivation of ground-nuts would have extended much in the Surma Valley.

Fodder crops like *juar*, broom-corn and Guinea grass have been grown on demonstration plots but the cultivators have not yet taken any interest in such crops.

(*iii*) Distribution of seeds should be made more and more through co-operative societies. A beginning has been made in Assam. We should also encourage as far as possible establishment of private seed farms.

(*iv*) This is a very difficult subject. In a Province like Assam, which is full of jungles and large uninhabited forest areas, the trouble is very great. The crop enemies are wild elephants, pigs, deer of all kinds, monkeys, porcupines and jackals besides birds of various kinds. Cultivators do not possess a sufficient number of guns. Even with guns it is difficult to stop depredations of animals like jackals. In numerous places, crops have to be watched both by day and night. Cultivators build raised huts over their fields whence they watch the crop at night by keeping up a noise.

(*b*) This is not important in Assam.

(*c*) Better seeds have improved crops like paddy, jute, potatoes and sugarcane. Manuring has improved the rice crop in the Khasi Hills.

QUESTION 14.—IMPLEMENTS.—(*a*) The question of improved implements suited to the economic condition of the people, the nature of the soil, the climatic conditions and the size and power of draught animals is one which requires careful study by a competent officer and until such a study is completed no definite conclusions can be arrived at.

(*b*) Improved implements and machinery like sugarcane-crushing mills and iron pans, for which there is already a demand, should be sold on the hire-purchase system to those who cannot afford to pay the price at once. This has already been recommended by our Development Board in its last meeting and we are working out definite proposals for submission to Government.

(*c*) Manufacturers should know that conditions vary in different parts of India and the same standard implements will not do. They should send out representatives to study local conditions. Besides, implements should not be too costly and therefore beyond the means of our agriculturists. The manufacturers should also be prepared to sell implements on the hire-purchase system like Singer sewing machines.

QUESTION 16.—ANIMAL HUSBANDRY.—(*a*) (*i*) The local breed of draught bullocks and milch cows should be improved and for this purpose there should be a bull-breeding farm in every important district. There are also professional breeders, who are Nepalis. Such professional breeding should, if possible, be brought under control and improved by encouragement and assistance.

(*ii*) The milk-supply is almost entirely in the hands of Nepali graziers who keep their herds as near as possible to towns and supply milk, curd, *ghi* and cream to the townsmen. Pure milk is difficult to obtain as much adulteration is practised, particularly by retailers. In my opinion, Municipalities should establish their own dairies. The dairy industry with local cows cannot however be profitable as the milk yield is very poor. Cows of a better milking strain have to be imported.

(*iii*) The present practice of allowing dwarf immature bulls to roam at large has done much to degenerate the breed. This should be stopped if necessary by legislation compelling castration. The cultivators do not feed their cattle properly. The miserable cattle are allowed to roam at large in the winter after the rice crop is harvested and live upon whatever food they can manage to get. This not only deteriorates the cattle but makes the cultivation of dry weather crops without proper fencing impossible. The people should be compelled to collect and store the rice straw for their cattle and the impounding of stray cattle should be rigorously enforced.

(*b*) (*i*) Pastures are not only overstocked but in the dry weather they contain no fodder.

(*ii*) The cultivators will not enclose even standing winter crops like potatoes, sugarcane, mustard and pulse properly, not to speak of fodder grass for cattle.

(*iii*) Whatever dry fodder is available is not collected and stored. Two-thirds of the paddy straw is left standing on the fields to be trodden and eaten by stray cattle.

(*iv*) In the dry season green fodder on high lands is not available. In some places the people move their cattle to low-lying places called *jheels* for grazing. Fodder crops are not grown.

(*v*) The constituents have not been examined yet.

(*c*) December to March. Young cattle begin to thrive from May.

(*d*) (1) Collection and storage of hay.

(2) Cultivation of fodder crops.

(3) Ensilage in suitable places.

(*e*) There are really no large landowners in the Assam Valley—all are peasant proprietors. The landowners in the Surma Valley are most apathetic.

The Assam cattle are of a miserable breed. They are not at all properly looked after but still they breed fast. Frequently they are carried off by pestilence in large numbers. Bovine cattle cannot thrive in a wet and jungly place like Assam but buffaloes thrive well and the local wild buffalo is a splendid beast but the breed is fast disappearing as conditions favourable to it are also disappearing.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(*a*) This differs in different localities but the average for the whole Province, excluding hill districts, would be about 200 days. In some places some members of cultivating families come to towns and tea gardens for work as day labourers during intervals between planting and harvesting and again between harvesting and the time for cultivation which begins as soon as spring rains commence. Some follow subsidiary occupations such as lac-rearing, silk-rearing,

mat, basket and *jhampi* making, etc., and some collect fire-wood, building materials and repairs their houses during the slack season while a considerable number sit idle and do practically nothing to augment their income. In the Assam Valley, the women help a good deal in agricultural work and during the slack season they are occupied with spinning and weaving. They are not idlers at all. Professional cottage industrialists like braziers, bell-metal workers, weavers, fishermen and potters are also agriculturists and they are fully employed in their own avocations during the agricultural slack season.

(*b*) Government are assisting the silk-rearing industry by supplying better and healthier seeds. The lac-rearing industry may be encouraged by abolition or reduction of the lac duty and by issue of brood-lac. Better marketing may be assisted by formation of co-operative sale societies. The Industries Department also assisted pisciculture by supply of carp-fry. We are also supplying orange seedlings and grafts and pine-apple suckers to the public.

(*c*) Really there are no obstacles except that the mill industry has to some extent restricted cottage industries in spinning, weaving and manufacture of metal wares.

(*d*) & (*e*) This will not provide employment. Already rice and oil mills and tea gardens exist in rural areas but the cultivators rarely work in them.

(*f*) Yes, not only for introduction of improved methods and appliances but also to arrange for better marketing of the products. The last-named subject should be studied by a man with considerable business experience.

(*h*) Intensive propaganda by the Public Health Department and the active interest of District Officers in rural reconstruction work.

QUESTION 18.—AGRICULTURAL LABOUR.—(*a*) (*i*) There is at present shortage of labour for tea cultivation. There is however a regular organisation to recruit labourers for tea gardens from other parts of India and legislation to check abuses, etc.

(*ii*) These areas in Assam are being fast taken up by settlers from East Bengal who are migrating permanently.

(*b*) For any large agricultural undertaking whether a tea garden or any other agricultural farm, agricultural labour is difficult to obtain. Neither the local people nor immigrants from Bengal will work on tea gardens or farms, though occasionally some do carry out piece work on contract. They do not like to identify themselves with imported indentured labourers from other Provinces. Besides, no one is landless in Assam and agriculturists do not like to leave their land and work on estates as permanent labourers. The estates must therefore depend on imported labour.

(*c*) I do not think there is anything like surplus agricultural labour in Assam.

QUESTION 20.—MARKETING.—(*a*) With regard to all agricutural produce of this Province, there are only two markets, viz., the local market and the Calcutta market. By the term local market, I mean the local purchasing organisations like those of the Marwaris which are spread over the country in local bazaars and marts, both large and small, and which are more or less accessible to agriculturists everywhere. Besides, agriculturists can sell their products at their very doors to small traders who visit the villages and make arrangements to carry the produce to the nearest mart. More roads and better roads will no doubt improve market facilities and reduce the cost of carriage, but on the whole I should think the existing local marketing facilities are satisfactory.

In the Calcutta market, there seems to be a good deal of speculation and consequent fluctuation of prices in jute, rice, cotton and mustard though fairly correct forecasts are published. In the case of tea, however, the producers are powerful enough to guard their interests and prices are regulated on the natural basis of demand and supply.

(*b*) The existing system is certainly not to the advantage of the agriculturists, but until the people advance in education and learn to combine and market their commodities better the existing system cannot be improved. My answer refers to produce grown by the mass of small cultivators such as paddy, jute, mustard, rape or other oil-seeds, cotton, potatoes, *gur*, fruits—specially oranges and *matikalai*.

QUESTION 22.—CO-OPERATION.—(*a*) (*i*) As already stated, the Government staff for supervision in Assam should be strengthened and, wherever necessary, Government loans for long terms should be made available for facilitating co-operative mortgage credit operations. Besides, for better organising and running (in the initial stages) of co-operative non-credit societies such as sale societies and industrial societies, Government financial assistance should be given to enable the societies to employ competent managers with business experience.

(*ii*) We have already started a non-official agency in the Surma Valley known as the Surma Valley Co-operative Organisation Society the object of which is to encourage the growth of co-operative work in promoting rural sanitation and rural industries. It is to be regretted that enlightened non-officials are not coming in larger numbers to do rural reconstruction work in co-operation with the official staff.

(*b*) (*i*) The development has been almost entirely on the credit side of the movement. Out of nearly 1,000 societies now in this Province, 969 are credit societies. A large majority of the credit societies are solvent and are running satisfactorily though overdues, which come to about 17 per cent of total loans outstanding, may be considered as large. The badly run societies are almost without exception, those which are being managed by either incompetent or dishonest office-bearers. Closer Government supervision by an adequate staff is necessary.

(*ii*) We have no societies which may be properly called purchase societies. There are of course some consumers societies in urban areas which purchase goods for retail sale to members and these are known as co-operative stores. Our agricultural credit societies are allowed to purchase seeds, etc., from Government seed depôts for distribution to members. The value of seeds, implements or manures taken by each member is shown as a cash loan in the loan book and the purchases are financed by the Central Banks who pay directly to the seed depôt. These loans are made repayable at the end of the harvest and both the Central Banks and the societies charge a lower rate of interest for such short-term credit.

(*iii*)
(*iv*)
(*v*)
(*vi*)
(*vii*)
(*viii*) } None existing in this Province.

(*ix*) A reference has already been made to the formation of a Co-operative Organisation Society in the Surma Valley.

(*c*) I do not think this would be proper or feasible.

(*d*) The credit societies have in the main achieved their object. At least, in areas served by the existing societies the prevailing rate of moneylenders' interest has been brought down considerably. These societies up till now however serve only a very small section of the rural population. At the end of last year the members of agricultural credit societies numbered 36,927 and they were indebted to their societies to the extent of Rs. 9,64,927. In other words, the loan per head of member stood at Rs. 26 only. As a matter of fact, however, in Assam a considerable number of members join societies merely for the sake of co-operation and not to borrow. Really about half of the members are actual borrowers and so the loan per head of borrowing members will come to about Rs. 50.

The moneylenders' rate of interest on unsecured loans may be put down at 36 per cent per annum on an average but the co-operative societies charge interest at an average rate of 15¾ per cent. Thus, during the last year alone, the borrowing members were saved from moneylenders' interest to the extent of nearly two lakhs of rupees. Besides, the agricultural societies held at the end of the year a sum of Rs. 1,42,280 as deposits of members and a further sum of Rs. 55,635 as share capital paid up by members. The two sums together represent the members' savings invested in their societies.

QUESTION 23.—GENERAL EDUCATION.—(*a*) Sons of actual agriculturists rarely proceed above the middle school. Even in elementary and middle schools, the education they get instead of giving them an agricultural bent

has the contrary influence with the result that the boys after leaving school either give up actual cultivation work or become agriculturists of an indifferent type.

(*b*) (*i*) I am not in a position to suggest definite methods, but the present system certainly requires a thorough change which may however be too costly for the Government to undertake.

(*ii*) Compulsory primary education is going to be tried in Assam shortly. I have no experience.

(*iii*) I am not aware of the exact position in Assam.

QUESTION 24.—ATTRACTING CAPITAL.—(*a*) Men with large capital and enterprise are very few in Assam, but Indians of other Provinces having command of capital may come and start agricultural undertakings if waste lands are settled with them. At present in settling waste lands for ordinary cultivation, the small cultivator who actually tills the soil is preferred.

(*b*) There are no large owners of lands in Assam except in the districts of Goalpara and Sylhet which are permanently settled. These owners are not sufficiently enlightened to undertake works of land improvement.

QUESTION 25.—WELFARE OF RURAL POPULATION.—(*a*) As already stated by me rural reconstruction work, under present circumstances, cannot be left entirely to patriotic non-officials. Their number is very few and they do not get sufficient support and encouragement from either the wealthier classes or the politicians. The Government should take up this work and the District Officers should identify themselves with this work far more closely. The Assam Rural Self-Government Bill has been recently passed in the local Council. This legislation provides for appointment of village authorities the main functions of which will be to improve village sanitation and medical relief. Under this legislation, the Local Government may appoint a Registrar of Village Authorities to control the working of these bodies but unless District Officers wholeheartedly supervise and take an active interest I am not sanguine of success. Abuses are possible and unless these are checked, the enthusiasm of the rustics will never be roused. In the old days there was much co-operation in the villages and people combined to undertake works of public utility. At present, however, there is much of dissension and friction in the villages.

(*b*) Such enquiries will be largely suspected and I do not think that very reliable information will be collected.

(*c*) No.

QUESTION 26.—STATISTICS.—(*a*) (*i*) We get quite accurate figures for the six temporarily settled plains districts which possess a fully organised land record staff. For the two permanently settled plains districts and the hill districts, only conjectural figures are available. Reliable figures for these places cannot be had unless extra staff be entertained.

(*ii*) This is arrived at as a result of experimental harvestings made by officers of the district staff and the staff under the Director of Agriculture. District Officers and the Deputy Director of Agriculture report estimated outturns to the Director of Agriculture who finally puts down the percentage. The estimates are, I believe, fairly accurate.

(*iii*) Enumeration of livestock is carried out by the land records staff in the temporarily settled districts and by *chowkidari* panchayats in the permanently settled districts. The existing method seems satisfactory.

(*iv*) This is done to some extent when a district is under resettlement. Ordinarily the Agricultural Department does not concern itself with such information.

(*v*) Agricultural statistics are collected and arranged by the Agricultural Department. They are forwarded to the Local Government and the Director-General of Commercial Intelligence and Statistics. Forecasts are published in the local gazette by the Director of Agriculture. Jute forecasts are forwarded to the Director of Agriculture, Bengal, who publishes in Calcutta a consolidated forecast for the three Provinces of Bengal, Bihar and Orissa and Assam. The existing method seems to be satisfactory.

(*b*) The collection and publication of inter-provincial trade statistics should be revived and to assist the Director, in this branch of work, a qualified statistical and commercial intelligence officer should be entertained on adequate pay.

R. B. K. L. Barua]

Oral Evidence.

24657. *The Chairman:* Rai Bahadur Barua, you are Director of Agriculture, Director of Industries and Registrar of the Co-operative Societies of the Province of Assam?—Yes.

24658. You have provided the Royal Commission with a note of the evidence that you wish to give. Do you desire to make any statement at this stage, or shall I proceed to ask you some questions?—It will be better if you ask questions.

24659. Would you give the Commission very shortly an account of your own training in any past posts that you may have held?—Before taking up the Department of Agriculture, I was Registrar of Co-operative Societies and Director of Industries. My substantive appointment is that of Deputy Commissioner in the Assam Commission and my present post is a superior I.C.S. post in Assam.

24660. How about your technical training?—Technical training with regard to agriculture I have none. When the Industrial Commission came here I was placed on special duty in connection with that Commission and that was why, I think, I was selected to hold the appointment of Director of Industries. Previous to that I was on district work and did only executive work.

24661. Have you had an opportunity of reading the note which has been provided for the Commission by the Surma Valley Co-operative Society?—No.

24662. Are you familiar with the working of that society?—Yes. The Surma Valley Co-operative Organisation Society was started only last year and I think they have begun work only this year.

24663. I propose to refer to one or two points raised in that memorandum. If, of course, you are not sufficiently familiar with any of the points to wish to answer, please let us know?—Unfortunately they have not sent me a copy of that memorandum.

24664. I shall remember that and make the point plain to you. Would you let us know how the officers of the Agricultural Department are distributed throughout the Province? In the first place, at the headquarters there is the Director of Agriculture that is you yourself; what other officers have you at the headquarters?—None. At present there is only one Deputy Director for the whole Province, although the sanctioned scale consists of three Deputy Directors. The two other posts have been held in abeyance as a measure of retrenchment. The Deputy Director is posted at Jorhat where there is an agricultural laboratory and also a farm. The Economic Botanist is also stationed at Jorhat and at the headquarters here in Shillong there is none besides myself.

24665. Then as regards the subordinate officers of the service, how are they distributed in the Province?—We have three Superintendents of Agriculture and the Province is divided into three charges. There is one Superintendent for the whole of the Surma Valley; there is one for the Upper Assam Valley districts; and there is one for the Lower Assam Valley districts. One is stationed at Sylhet, another at Gauhati and the third at Jorhat. These are the three Superintendents. Then we have got Agricultural Inspectors; we have one Agricultural Inspector in each sub-division in the Surma Valley, and in the Assam Valley one in each district.

24666. They are subordinate to the Superintendents?—Yes.

24667. What is the training of the Inspectors?—The Inspectors are all graduates either of Sabour Agricultural College or of the Nagpur Agricultural College.

24668. Is the promotion made from the Inspectorate to the Superintendent's grade?—Yes. At present we have got two Superintendents who were originally Inspectors and have been promoted to the Superintendent's grade.

24669. Have you a grade which is subordinate to the Inspector's grade?—Yes, they are called demonstrators.

24670. Where are they trained?—They are trained on our farms.

24671. On the central farm?—They are trained on different farms. We have got four farms; we train them there and then appoint them as demonstrators.

24672. Are you satisfied with their capacity?—I am not satisfied with their capacity. I think the training they get is not enough but to get a better class of men we have to pay higher.

24673. Is it a question of getting a better type of men or of improving the training?—The class of men that we recruit have not got sufficient training and I think a higher type of men would be better.

24674. Would you tell the Commission how many of these demonstrators you have in the Service?—We have got 52 demonstrators.

24675. How are they distributed?—Their distribution is given in the memorandum.

24676. I do not recall that it was made quite clear there. Could you point to the reference?—There are altogether 56 agricultural demonstrators of whom 22 are in the Surma Valley, 25 in the Assam Valley and 9 in the hill districts.

24677. Is the staff which you describe adequate for the tasks and duties with which your department is charged?—No; I think we want more Inspectors. I am speaking of the subordinate establishment, not only Demonstrators but also Inspectors. We have been increasing the staff almost every year and what is again necessary is to strengthen the superior staff. At least we want one more Deputy Director because one Deputy Director cannot manage the whole thing at all. That is in regard to the executive staff. With regard to the scientific staff also, I have already given my opinion in my answers to the Questionnaire.

24678. Yes; you point out that "the only superior officer in the scientific staff is the Botanist"?—Yes. We had a Chemist, but he retired and after him nobody has been appointed in his place.

24679. Would you let the Commission know whether in your view your arrangements for recording experience, the result of various experiments which you are making and the result of your policy in the matter of demonstration, are satisfactory? Do you think that records of these matters have been kept?—Yes; records of scientific investigations have been kept no doubt.

24680. But are the results of experiments or demonstrations being preserved?—We are experimenting in our farms and that is recorded as scientific investigation; only the results of experiments have been recorded and no record is kept particularly with regard to demonstrations.

24681. You realise how soon these matters are forgotten and you realise also, I am sure, how valuable the accounts of failures as well as the accounts of successes will be in the future?—Yes; as a matter of fact, we used to publish the results of demonstration also every year; but, as a matter of economy, those reports have been abolished.

24682. As a measure of economy?—We used to publish reports with regard to experimental stations and demonstrations.

24683. That has been discontinued?—Yes.

24684. And that as a measure of economy?—Yes.

24685. But the fact that you do not publish them does not prevent you from recording, does it?—No; as a matter of fact, a summary of all our demonstrations as well as scientific investigations is given in our annual reports.

24686. Have you anything which you wish to say about Pusa, and the services rendered by Pusa to your department in this Province?—Yes; we had here lately the assistance of the Mycologist in the matter of potato disease and we had also the assistance of the Imperial Agriculturist in drawing up a scheme for the cattle farm that we are going to open at Khanapara. He visited the Province twice last year in connection with that. As a matter of fact, the site was selected by him and the policy also was laid down by him.

24687. Are you satisfied with the services rendered by Pusa?—So far I think we are satisfied. But my opinion is that our officers might get

more training at Pusa. We cannot send all our officers at once; but if we send them one by one every year for training that will be a good thing.

24688. Have you put up proposals to Pusa?—No; I have not yet put up proposals because the training they are now giving is post-graduate training which is only for Provincial Service officers. I mean these Agricultural Superintendents can get it, but I should also have the subordinate officers trained there if possible as also our scientific assistants. We have some assistants and they also need further training in particular branches of work, either in mycology or entomology.

24689. What I want to know is whether you have made any proposals?—No; I have not made any proposals.

24690. You would expect to make proposals yourself, and you would not expect to receive invitations in these matters, would you?—The policy with regard to training has been laid down and the training is given only to distinguished graduates in science and also to officers of the Provincial Agricultural Service.

24691. I understand that having no training facilities here, you are sending certain officers or certain persons who are to be officers of the Service to Agricultural Colleges in other Provinces?—Yes.

24692. How is that working?—We send them according to our requirements, that is, when we want to appoint them. If we want any Agricultural Inspectors then we send some students there at Government expense.

24693. *Prof. Gangulee:* Where do you send them?—We are now sending them to Nagpur.

24694. How many have you sent already?—There are three now undergoing training at Nagpur and one at Bangalore in regard to dairying.

24695. *The Chairman:* Are you in touch with neighbouring Provinces in the matter of research?—We are not actually in touch in regard to research but we are getting help sometimes.

24696. In what way?—From Bengal we used to get stud bulls from their farm at Rangpur. Sometimes we get their seeds; for example, the Dacca paddy seeds. They also take our seeds sometimes.

24697. *Rai Bahadur R. M. Das:* Also sugarcane setts?—Yes.

24698. *The Chairman:* In dealing with pests do you keep in close touch with the neighbouring Provinces?—Yes; we are to inform them by wire as soon as any pest is attacking any district adjoining the Province of Bengal and they also inform us similarly when there is any pest in any of the districts adjoining the Province of Assam. Also the water-hyacinth problem is being worked out in consultation with Bengal.

24699. Have you got a combined policy for dealing with water-hyacinth?—No; my department is not dealing with water-hyacinth at all; it is being dealt with by the Local Boards or the District Boards.

24700. Do you think that is a good scheme, or do you think that you yourselves might take it in hand?—I think there ought to be an officer in the department to deal with water-hyacinth.

24701. *Prof. Gangulee:* It is dealt with by the Local Boards and not by the Public Works Department?—No, not by the Public Works Department; but by the Local Boards.

24702. *The Chairman:* Are you aware whether any attempt has been made to co-ordinate the efforts of the various Local Boards?—In this matter it is the Local Boards of the Surma Valley that are concerned; it is there that the pest exists; it does not exist in this part of the Province and I do not think there is any co-ordination between the different boards, but I am not quite sure about it.

24703. Your responsibility extends over the whole Province, does it not?—Yes.

24704. Have you ever thought out at all the possibility of a central body with its institutions at Pusa and elsewhere taking a larger part in solving the various problems of all the Provinces and being in a position to assure co-ordination and inter-communication between the

Provinces? Have you thought out that problem at all?—I have not thought about it; but the thing is the different Provinces have got different problems and for that reason the Provinces have to find their own scientific departments more or less complete. Of course, the Government of India or Pusa authorities might depute some of their officers to study the different conditions in the different Provinces when asked for.

24705. There are certain problems of general application, and of a fundamental nature, which might well be attacked by a central institution?—Probably these questions will better be studied and better handled in a central institution.

24706. Have you in mind any scheme to extend or rather to create facilities for agricultural education in the Province?—I have suggested it in my answers. I think that we should have some sort of agricultural education in our middle schools, if not in all the middle schools at least in selected middle schools, one in each district. Of course I have got no experience in this matter but that is my impression. At present we are doing absolutely nothing with regard to agricultural education.

24707. It is a very difficult problem in these areas where population is so sparse, is it not?—Yes.

24708. On the question of demonstration and propaganda, are you finding that demonstration in the cultivators' own fields is the most effective?—I should think it is effective. But what the cultivators want is a very striking improvement. Unless the improvement is very striking they are not impressed.

24709. You mean 4 or 5 per cent is not good enough; they want 20 per cent?—Yes; they want a very heavy yield and that too without changing their own methods if possible.

24710. Then under the heading "Administration," Question 4, you say, "Further railway development in this Province is urgently needed." Have you ever represented the need for that development to the Government here or to the Railways?—Of course at every opportunity I brought to the notice of the Government not only the necessity of railway extension but also the necessity for other facilities.

24711. Have you any definite schemes in hand which the railway companies might put into effect?—I think, for instance, that the transport of fruits and vegetables such as potatoes from Assam is very defective; the system ought to be improved; they ought to provide proper wagons.

24712. But on this question of development you are thinking, I take it, of the possibility of further branch and feeder lines being built?—Yes.

24713. Have you any definite schemes in mind?—Practically in all districts railway development is needed, but it is gradually coming; during the last few years we have seen very good development, and if that goes on, I think in a few years the extension of railways will be very satisfactory in Assam.

24714. Do you think the railway authorities have been remiss in the matter of providing further railway facilities, or are you satisfied with what is being done?—I am satisfied with the rate of progress in this matter, at least.

24715. Are your principal roads good?—No, they are all *kutcha;* except for very short lengths they are all unmetalled. We have got two principal trunk roads and both of them are unmetalled and not fit for mechanical transport.

24716. Are the roads you are thinking of to some extent under the Provincial Government?—All the trunk roads are under the Provincial Government and most of the feeder roads are in charge of the Local Boards.

24717. Are the roads under the Local Boards better or worse than they used to be?—The roads under the Local Boards are certainly worse than those maintained by the Public Works Department; they have not got the money to improve those roads.

24718. Are the roads under the local authorities getting worse, or have they always been as bad as they now are?—I think they are as bad as ever; they have not been improved at all.

24719. In the note by the Secretary of the Surma Valley Co-operative Society, it is suggested that when new roads are made instead of making burrow pits on both sides of the roads, the material for the road might be taken from one side only, so that a continuous canal might be cut alongside the road, with a view to improving the drainage of the district and also with a view to providing water transport during those months of the year when the roads are impassable. Have you large areas in the Province where the land is sufficiently flat to make a scheme of that sort practicable?—All the plain districts are entirely flat, but then this water communication along the roadside is needed only in the Surma Valley. This does not really apply to Assam at all, because however deep the canals might be they would all be dried up in the winter; it is high land; but this question as to whether you might have a canal alongside the road is a question which is, I think, to be decided by the engineers; I do not know.

24720. But it bears very closely on agricultural development and I wanted to know whether you had any views to express?—It may be dangerous to have a canal so near the road; the road may be damaged.

24721. *Rai Bahadur R. M. Das:* In one district in Bengal the District Board makes roads with such canals alongside them which are used for ferry traffic by boat; the roads have not been damaged by the canals? —Probably the better way would be to have a cart-track on one side of the road so that the road may not be damaged by heavy bullock-cart traffic.

24722. *The Chairman:* During the dry months?—Yes.

24723. And then you allow the bullock traffic to go on the surface of the road during the wetter months of the year; is that your idea?—In the Assam Valley even in the rainy season the track will be useful.

24724. Who is going to use the road?—The road may be used by pedestrians, mechanical transport, motor cars, and so on. Bullock-carts do a lot of damage to *kutcha* roads; the annual expenditure in repairs is very great on account of that.

24725. Would it not be rather a drastic step to prevent the cultivators from using the roads with their bullock-carts when the cultivators largely pay the taxes from which the roads are maintained?—The side track will also be maintained. As a matter of fact, that system has been adopted in one district, and there has been no complaint.

24726. Have you ever heard of a corduroy road?—No.

24727. That is a road made of logs laid side by side crossways over the road; has that ever been tried here in the wetter districts, do you know?—It has not been tried; it would be very costly, I think.

24728. It depends on how near the timber is?—Yes.

24729. You have told us that you are in charge of the co-operative movement?—Yes.

24730. Have you any special staff to assist you in that work?—Yes, I have got now one Assistant Registrar and nine Inspectors.

24731. Do you yourself find time to examine each proposed society that comes up for registration?—Beforehand, of course, I have not the chance of seeing whether they are properly organised. The registration papers generally come through the Inspector and the District Officers to me; but I, of course, annually inspect a certain number of societies.

24732. In answer to our Question 5 on Finance, you say, "The co-operative credit movement has failed in localities where large sums of money were issued in *taccavi* loans and remissions were large." Would you describe exactly what happened?—In that district there was failure of crops for two years; in the second year of the failure Government had to issue a very large amount of loans, about 18 to 20 lakhs of rupees; they issued these loans to all needy people. The result was that, I think, about a quarter of that amount had to be remitted as irrecoverable; about 5 or 6 lakhs had to be remitted by the Government.

24733. Was that owing to an extensive crop failure?—The loans were given to persons who had no property and from whom no recovery was possible.

24734. Were these loans given within a very short period of time?—Yes.

24735. What were the special circumstances which caused these loans to be given?—They were given on account of failure of crop; at the same time our societies also were given Government loans, and with that money they issued loans to their members in the same locality. The societies realised everything, but Government had to remit. The people came to realise that if there had been no society there probably they would have got loans from Government on easier terms and most of that would have been remitted.

24736. What happened to the loans that the co-operative societies had already advanced?—They realised everything and they repaid the Government loan in full.

24737. What happened to the existing co-operative loans?—The co-operative loans were realised from the members; of course extensions had to be given, but they were realised.

24738. Did the societies collapse?—They collapsed afterwards because the members did not like to maintain the societies afterwards. Some of them collapsed; some of them are still existing.

24739. In the note by the co-operative society, it is suggested that in some cases where payment of interest and repayment of capital on loans advanced by the co-operative societies on a short-term basis are overdue, the fact really is that the loan has been taken for what may properly be called long-term purposes?—Yes.

24740. Do you agree with that?—The distinction is not sometimes properly made by the societies themselves, but really short-term credit is never overdue; for instance, the loans given for purchase of seeds.

24741. Then under the heading Agricultural Indebtedness, have you any statistics that you could lay before the Commission showing the districts in which agricultural indebtedness is most heavy?—I am not prepared with statistics, but in the preliminary memorandum I have given an estimate of the total indebtedness of the whole Province.

24742. Yes, I saw that, and I wondered whether you could amplify that at all; is the extent of the debt in these districts known accurately?—It is not known accurately.

24743. There has not been anything in the nature of a survey?—No.

24744. It has been suggested in the note that I have referred to that one of the main causes of indebtedness is the small size of the holdings in the districts that you refer to?—I am not sure about it; I do not think that it is entirely due to that.

24745. You do not think you have yet come to the stage where the smallness of the holding renders the cultivator's labour uneconomic in the sense that he cannot finance himself and his family?—To some extent that is so in some places, but as I say in my answer, the evil is not very great here in Assam.

24746. How about the problem of indebtedness in the hill country?—In the hill country there are no statistics available at all. Nothing is known.

24747. What is your impression?—I think that, compared with the people in the plains, the hill people are not very heavily indebted.

24748. They do, I take it, finance themselves through the money-lender?—Yes, they do. In the Khasi Hills, for instance, they are financed by the Marwaris.

24749. Are you familiar with the Provincial or All-India statutes dealing with debt?—There are certain enactments of course with regard to debt.

24750. Are you thinking of any in particular?—They are not in force in Assam always. For instance, the Usurious Loans Act is not in force.

24751. You do not hear of them being put into force in this Province?—No, they have not been in force.

24752. *Mr. Calvert:* It is in force, but not enforced?—No, not enforced.

24753. *The Chairman:* Then about land alienation also, there are certain enactments in other Provinces?—There is none in this Province.

24754. Have you any exact particulars about the size of holdings other than those which have been provided?—No, that is what has already been provided in the memorandum by the Director of Land Records. Beyond that there has not been any sort of enquiry with regard to the size of holdings.

24755. Under the question, Fertilisers, you say that in the Khasi Hills bonemeal is now largely used for manuring terraced rice fields. Where is that bonemeal purchased?—From Calcutta; we purchase only sterilised bonemeal from Calcutta.

24756. What price do you pay per ton?—That differs in different places in different years. I think I could give you last year's figures; I think it came to something like Rs. 3 per maund.

Rai Bahadur R. M. Das: No, up to the foot of the hills it comes to about Rs. 8.

24757. *The Chairman:* Is there any considerable export of bones from the Province?—Yes, there is. We had a bone-crushing factory here in the department but that was not successful and so we gave it up.

24758. Is there any concern, or has there been any concern manufacturing bonemeal in the Province?—No, none yet.

24759. Would you give us in detail your arrangements for the distribution of seeds?—We have got three seed depôts, one at Gauhati, another at Jorhat, and the other at Sylhet. In a particular seed season, for instance, the potato season, we have branch depôts, temporary depôts in different centres fed by these main depôts and from those depôts we sell to the public, the agriculturists; lately we have been issuing through the co-operative societies largely.

24760. Are you getting any seeds of improved varieties from Bengal or other Provinces?—From Bengal we have been getting paddy and jute, both *Chinsura green* as well as *kakia bombai*.

24761. Have you got the strain from there or the actual seed that you have distributed?—As regards jute seeds the best supply is available in this Province itself. The Bengal Government take all their supplies from Messrs. Birkmyre Brothers here in Assam who grow an improved variety of jute; we are also getting it from that source to some extent.

24762. How about rice seeds?—We get rice seeds from Bengal but we are growing them ourselves. We are getting seeds from our own farms and also from selected cultivators for distribution.

24763. Of this amount of 1,150 maunds of improved paddy seeds that you distribute, what percentage is grown in your own seed farms and what percentage do you buy?—Practically the whole of that is obtained from our own Province.

24764. The whole of that is produced from your own farms?—Yes.

24765. I notice that your note does not touch the question of Irrigation at all?—No; there was very little time and besides irrigation is not very important here.

24766. Is it not a problem in any district in the Province?—It is a problem in the winter, particularly in the Surma Valley where the water dries up; there is difficulty with regard to the particular kind of paddy known as *boro* grown in the winter.

24767. Do you think there is an opening for large irrigation schemes by canal or are you thinking rather of smaller schemes?—I am thinking of irrigation by means of pumps.

24768. From deep wells?—No, there is the fishery water, the *bhil* as it is known here and the surrounding area is cultivated with paddy. The only question is to get the water from the *bhil* on to the terraces above.

24769. That is ordinary lift irrigation from the *bhils* in the dry season. Do these *bhils* retain sufficient water?—Yes.

24770. Have you districts where *bunding* would be required?—There are *bunds* already provided by the Public Works Department in some districts to prevent floods.

24771. Is that a problem to which you have given close attention?—Yes, these *bunds* are, wherever necessary, properly maintained by the Public Works Department but some more *bunds* are necessary in places. In the olden days of the Ahom Kings they had a very good system of *bunding;* the Public Works Department have maintained only some of them and some of them are now in disuse.

24772. Is there any officer available in the Province to give advice to cultivators as to the carrying out of minor irrigation schemes?—There is none.

24773. Now about the question of Soils, have you had anything in the nature of a soil survey of the whole or any part of the Province?—When we had a Chemist he did some survey work in the Sibsagar district; since he left nothing has been done.

24774. Have you got the records of those surveys?—Yes.

24775. Have you used them at all?—These records were mostly with regard to liming of soils, but liming is not done by the ordinary cultivator. It is done by the tea-planters, but the ordinary cultivator never goes in for liming.

24776. *Prof. Gangulee :* Do you think there are any differences in the acidity of the soil?—Yes.

24777. *The Chairman :* And you have got the data for that?—Yes.

24778. In what district was the survey carried out?—In the Sibsagar district.

24779. What do you think is the most important deficiency in the soils of your Province?—I could not tell you exactly, but I think excessive acidity to some extent.

24780. Lime is deficient over an important area, is it not?—Yes.

24781. Is lime available?—Yes.

24782. Have any experiments been carried out designed to discover the effect of providing lime by artificial means?—The liming was done by means of crushed limestone but that has now gone into disuse even in the tea gardens.

24783. Have you tried the effect of lime in any Government farm?—Yes. It was tried on the Jorhat farm.

24784. With what results?—With satisfactory results. At the Jorhat farm, I should be able to give you the records of the liming experiments carried out.

24785. Now we come to the question of Veterinary. You say nothing about that in your note of evidence. Do you wish to make any remarks on it now?—I have not made any attempt to answer that question because Veterinary is not under me; it is administered by a different department.

24786. Do you agree with that division of responsibility, or rather do you approve of that division of responsibility?—I think I do.

24787. You do not want the Veterinary Service to be under yourself?—No.

24788. Are you in touch with the heads of the Veterinary Service?—Yes.

24789. Now then with regard to the question on Animal Husbandry. The Commission have had the advantage of looking over the Upper Shillong farm yesterday. Is that the only farm where cattle are bred?—That is at present the only farm.

24790. There was this other farm that you mentioned at Khanapara?—Yes, it is under construction.

24791. What is to be your policy at Khanapara?—At Khanapara we are going in only for draught animals and not for milk, purely draught.

24792. Whose advice have you sought?—We sought the advice of Mr. Henderson, the Imperial Agriculturist.

24793. Are you not going in for the dual purpose animal?—No.

24794. Then with regard to the farm that we saw at Upper Shillong yesterday what is your policy there?—The policy there is to have a breed of

cattle of a better milking strain than what we can get locally. That is the policy for the hill districts where that kind of cattle is known to thrive; they are no good for the plains; we have tried them there.

24795. How long has that herd of cattle been in existence?—Since the year 1896, I think.

24796. In continuous existence?—Yes. They have tried all manner of experiments with all kinds of cattle, namely, the Bhutia, Khasi and Manipuri species. No regular, definite policy has been followed from the beginning.

24797. How far do your milk records go back?—Our milk records have been kept since 1921, that is, since the farm was placed under a Deputy Director.

24798. Before that no record was kept?—Before that there was only the Farm Manager, and there was no one really efficient and capable of looking after these things.

24799. Do you know the milk records of the dams of the bulls at present in use in any of the farms?—We do not.

24800. Would you agree that a knowledge of the milk records of the strains from which your bulls are chosen is a very important point?—It is very important indeed. It is the bull which gives the milking quality to the offspring.

24801. In answer to our question as to when the shortage of fodder begins to tell on your cattle and when they begin to recover you say, "December to March. Young cattle begin to thrive from May." How acute is your shortage in this Province?—It is very acute.

24802. Not in the hills, I take it?—Not so much in the hills as in the plains.

24803. I noticed coming through the countryside that in some areas the cultivators were engaged in drying rice straw and then stacking it. Would that be for fodder?—Yes; it makes very good fodder.

24804. Why is that practice not more general?—The hay that is collected is perhaps meant entirely for the imported cattle which are more valuable.

24805. Imported working bullocks; is that it?—Yes, imported cart-bullocks.

24806. Are very few cart-bullocks bred in this Province?—Every cart-bullock has to be imported from Bihar from the various fairs there. As the cultivators pay a high price for them, they look after them and take proper care of them; the local cattle are not cared for at all.

24807. What attempts are you making to demonstrate the use of silage?—In the plains we have been making experiments in aboveground silos, but we have ourselves not been successful yet. Pit silos are not considered to be useful in the plains.

24808. Because of the wet?—Because of the heavy rainfall.

24809. Have you tried making a mound and making a pit silo in the mound?—Not that; we are trying bamboo silos.

24810. Are you familiar with the experiments at present being made in Bengal?—No. I do not know what experiments they are making.

24811. Would you know about those experiments if any were being made?—If they are making successful experiments, I should like to send one of my officials to see them.

24812. Have you attempted to find out what other experiments are being made in other parts of India?—I have myself seen silos in other parts of India, in Pusa and other places. But the conditions there are different; they have a small rainfall in those Provinces.

24813. Are there many sheep in the Province?—No; very few. They are all in the hills, not in the plains.

24814. How do they stand the rains?—They do not thrive in the hills. The sheep that are there have been acclimatised, but there is very little wool on them.

24815. What grasses grow on these open down lands?—We call that thatch grass.

24816. Is that a fodder grass?—That is a fodder grass when very young, but when it is mature it is not eaten by the cattle at all.

24817. Is the goat an important animal in the agricultural economy of the Province?—No. It is like our cattle; we get a miserable type of goat in Assam.

24818. Would you turn to your answer to Question 17 on page 5? I understand that you are in charge of the sericultural industry; is that so?—Yes.

24819. Is that an important industry in the Province?—It is a very important industry.

24820. What special officers have you to assist you in that work?—I have a Superintendent and also an Assistant Superintendent of Sericulture. We have got two sericultural stations with their staff of rearers, overseers and all that.

24821. Are there many co-operative societies for silk-rearing?—No.

24822. Is that a whole-time occupation or a part-time occupation?—It is a part-time occupation.

24823. Have you no whole-time sericulturists?—There is a caste called *Katonis*. But the men belonging to that caste also do cultivation because silk-rearing is only done in certain months of the year, about seven or eight months; in the winter there is no silk-rearing.

24824. Do the sericulturists do their own reeling?—Most of them do their own reeling.

24825. Have you a weaving caste here?—There is a weaving caste in the Surma Valley; but, in the Assam Valley, there is no caste restriction; everybody weaves.

24826. Is most of the silk grown in the Province woven in the Province?—Yes.

24827. Is there an important export trade?—There is an important export trade in woven Assam silk goods, and also in *muga* reeled silk which is taken for making embroideries in Bengal and also for fishing lines.

24828. Silk thread for fishing lines?—Yes.

24829. That is twisted in the Province?—That is reeled in the Province. We grow three varieties, the mulberry, the *muga* and the *eri*.

24830. *Prof. Gangulee:* Which is more favourable for silk-rearing, Assam Valley or Surma Valley?—Assam Valley.

24831. *The Chairman:* Have you available the average net profit per acre under mulberry?—Small areas are cultivated by these people in their homestead land.

24832. Do you know how much net profit accrues to the cultivator from an acre of mulberry?—Sometimes they get the leaves from other places also, so that the acreage profit is difficult to calculate. A man may not have any mulberry tree in his land; he may be getting it from jungles and other places; he may be rearing silk without any mulberry cultivation.

24833. Have you ever had a chance to study the hydro-electric survey of the Province, if there has been one?—There has been a hydro-electric survey.

24834. By the Government of India?—By the Assam Government.

24835. When?—That was three or four years ago. Mr. Blenkinsop, one of the Executive Engineers, was put in charge of it and he has submitted a report.

24836. Is it complete?—Yes.

24837. Have you seen it?—Yes.

24838. What conclusion did you draw from reading the report?—There are great possibilities of developing hydro-electric power in Assam. For instance, the Burnihat scheme to harness the river which you crossed the day before yesterday nineteen miles from Gauhati, will develop electricity to run an electric train from Gauhati to Shillong.

24839. Is there a stream of water running all through the year near this town?—Yes.

24840. Is it used for developing hydro-electric power?—Yes, it is used for electric lighting. They have taken only a small amount of power. If there had been industrial requirements they could have developed much more power.

24841. *Sir Henry Lawrence:* Where is that place?—It is only a mile from Shillong.

24842. *The Chairman:* You say nothing in answer to our questions about Forests. I should like to ask you whether there has been sufficiently close touch between yourself as Director of Agriculture and the officer in charge of the Forest Department in the Province?—I am afraid I am not in close touch. As a matter of fact, there are certain subsidiary industries which really ought to have been fostered by the Forest Department but which are not receiving their attention, for instance, lac-rearing.

24843. Does not that come under the head of Industries?—Yes; it comes under Agricultural Industries.

24844. You are not responsible for that?—No; I am not. I am not because I have not any staff to do lac culture. I should think the Forest Department is pre-eminently fitted to look after that.

24845. Have you ever asked them what they think about it?—There was a proposal that they should do it, but it was ultimately decided that they have not got to do it. At present nobody is doing anything with regard to lac.

24846. Is there a large quantity of fodder grass in the forests in this Province?—The forests are generally very far away from the village sites, so that the forest areas are really of no use to the cultivators; but they are of use to the professional graziers who roam about the country with their herds and from them of course the Forest Department realise a grazing tax.

24847. Is it from the professional graziers that the cultivators in the plains buy their working cattle?—Yes, their plough bullocks.

24848. Are there any forests reasonably near the plains area where reserves of fodder could be accumulated against the season of shortage?—Reserve forests are far away from the village sites.

24849. How about the provision of fuel for the population in the plains?—They can get it from the village forests, and also by paying a small fee from the Unclassed State forests. Reserved forests are far away.

24850. Are there ample supplies of fuel in the plains?—I think there is not only ample fuel, but also building material.

24851. There is no shortage?—There is shortage in the Surma Valley where the country is mostly open and there are no forests.

24852. That is owing to the difficulty of expensive transport?—Yes.

24853. Do you happen to know whether the Forest Department is doing anything to meet the requirements, in the matter of fuel, of the population in that area?—I do not think they are doing anything.

24854. Do you think the absence of that fuel leads to the burning of cowdung?—Cowdung is very rarely burnt here in Assam.

24855. Where no fuel is available what is burnt?—They burn jute stalks or other materials, such as bamboos, which they grow themselves. Cowdung is very rarely used as fuel. For boiling and preparing par-boiled rice they make use of cowdung.

24856. Has there been any survey of the organisation of marketing in the Province?—No, there has not been any survey.

24857. Do you think that a survey would be useful?—The main channels of marketing are well known, but I think a survey would be useful; particularly before we start co-operative marketing we ought to have a survey.

24858. On the question of co-operation, how do you suggest that the case for long-term credit should be met?—The only way, as far as I can see, is to have mortgage credit organised.

24859. By land mortgage banks?—Yes.

24860. In the meantime, there is nothing of that sort?—At present, of course, mortgage credit is being given by the ordinary moneylenders at high rates of interest.

24861. Because there is nothing in the nature of land mortgage banks?—We have just started one; one is now in operation.

24862. Actually in operation?—Yes, actually in operation.

24863. How is the capital provided?—At present their capital is provided from shares and deposits.

24864. Any debentures?—They have not issued debentures yet, although there is provision for it in the by-laws, and no Government loan has yet been given to them.

24865. In what area is the bank in operation?—In the Kamrup district, at Gauhati.

24866. How long has it been working?—For a year.

24867. It is a little early to say whether it has proved a success or not?—Yes. Their share capital is now Rs. 50,000.

24868. In answer to Question 23, you say on page 8, "Compulsory primary education is going to be tried in Assam shortly." In what districts is it going to be tried?—I think it is going to be tried all over the Province, the Act has been passed in the last Council, and I expect something will be done.

24869. Will the local authorities have the option of undertaking schemes of compulsory education under the Act?—Yes.

24870. Have the local authorities the option to start schemes of compulsory education now?—No; the Act gives them the power to do that, and also to levy a cess.

24871. I was trying to get from you whether, at this moment, the Act is part of the law of the Province?—It has not been enforced yet.

24872. *Sir Henry Lawrence:* What further steps are necessary before it can be put into force?—Rules have to be framed by the Local Government under the Act; the rules have not yet been framed.

24873. Is that the only thing that is wanting?—Yes.

24874. *Prof. Gangulee:* You propose to levy a cess?—Yes; only the skeleton Act has been passed.

24875. You are going to have a definite cess?—Yes.

24876. *The Chairman:* In the meantime, I take it there is no free primary education?—No.

24877. What do you say about the water-supply in the villages on the plains?—The Local Boards construct wells and tanks in the rural areas for the provision of drinking water, but I think these wells and tanks are not properly looked after; the difficulty is that the people contaminate the water. I think there is a sufficient number of wells and tanks, but the great difficulty is to protect them from contamination.

24878. Do you expect that one of the results of the passage into law of the Assam Rural Self-Government Bill, which is at present before His Excellency, might be the creation of village authorities capable of taking charge of matters like water-supply?—That is what it is meant for, but, as I have already stated in my replies, to make the new legislation more effective you must have closer co-operation and closer control by the District Officer.

24879. You do not think that the villages would be able to supply sufficiently active management to control their own affairs?—That is also the case. Again, generally we find that there is much dissension in these villages. Unless there is somebody who is above petty quarrels and feuds the working of these village authorities will never be satisfactory.

24880. *Prof. Gangulee:* What is the nature of the feuds? Are they communal?—They are not communal, but there are generally two or three influential men in the village, each having his own following; it is not communal.

24881. *Sir James MacKenna:* You have got a large number of duties. How much time are you able to devote to the duties of Director of Agriculture?—My duties as Director of Agriculture occupy about half of my time; the other half is devoted to the two other departments.

24882. Do you think that the work of the department is sufficient to justify a full-time Director of Agriculture?—A full-time Director would have been appointed long ago, had it not been for the retirement of Mr. Birt, who was the senior man in the Indian Agricultural Service, and he retired on proportionate pension.

24883. On account of ill-health?—Yes; and then, this post has remained an I.C.S. post.

24884. It was made an I.C.S. post?—Yes; as a matter of fact, it has all along remained an I.C.S. post.

24885. Do you think, if it were made a full-time appointment, there would be work enough for a full-time Director?—I myself think that, unless the staff is properly and fully developed, there will not be sufficient work for a full-time Director. It is only a question of expense; if sufficient money is provided, the staff and the work can be fully developed, and then there will certainly be work for a whole-time Director.

24886. Till that full development comes about, would it not be better to have a specialist as Director, who would also do a certain amount of research?—That, I think, would be more useful than the present state of things.

24887. Have you any views about the training of your staff locally? Do you think that the establishment of a small agricultural education institute, for the purpose of training your own staff, is possible, within the finances of the Province?—Is that with regard to the subordinate staff?

24888. Up to the provincial grade?—I do not think we can have an institute of that kind.

24889. In that connection, you seem to think that Pusa ought to take up the training of your subordinates. Would it not be degrading Pusa from the position of a station for post-graduate training and research work to the level of a provincial college?—They ought to provide training for men in Provinces like Assam, which cannot afford to bear the expenditure of having a separate college of their own; it is not intended for the bigger Provinces.

24890. In consideration of the financial position of little Provinces, Pusa might alter its cast-iron ideas in regard to education?—Yes.

24891. In your printed memorandum, you say that at present the only superior officer in the scientific staff is the Botanist. You do not get any service from the Deputy Director as a scientific officer?—He is entirely occupied with administration and demonstration, and he is not doing any scientific research.

24892. You are of opinion that your Chemist, Entomologist, Mycologist and Livestock Expert should belong to the Provincial Service?—On account of the paucity of funds, I say that that should be so. We cannot possibly pay for Indian Agricultural Service officers in all these branches.

24893. That is on account of the financial position?—Yes; only on account of the financial position.

24894. Can you tell me how many of your officers are engaged on research as opposed to administration?—We have besides the Botanist, as I have said, a Chemical Assistant, an Entomological Assistant and two Botanical Assistants.

24895. These are the research men. Have you a research man on the agricultural side? Is any research work being done on agriculture pure and simple?—None.

24896. Are any field experiments being conducted?—Field experiments are conducted by the Superintendents and Inspectors.

24897. Cannot those do research?—I do not call them research officers; I call them officers for administration and demonstration.

24898. Has there been any development of the 'agricultural association' idea in the Province?—We have not started any agricultural associations.

24899. Is any interest being taken by large landholders in agricultural improvements?—There are large landholders in this Province.

24900. Are they taking any interest in the improvement of agriculture?—Except one, I have not seen that any of them are; the Raja of Gauripur is taking an interest and his Dewan will appear before the Commission as a witness.

24901. What is the nationality of your staff?—In the Surma Valley they are all Bengalis; in the Assam Valley, they are mostly Assamese, both Hindus and Mahommedans; in the hill districts they are hill men.

24902. They more or less vary according to the geographical boundary?—Yes; otherwise, they cannot get on with the cultivators owing to the language difficulty.

24903. Would you say that Pusa has been of substantial assistance to Assam in any branch of research?—Nothing of research has been done on our behalf by Pusa, but Pusa is not to blame for that; we have not asked them to undertake any research, as far as I know. I have been in charge for three years, and during that time we have not asked for any assistance, except for combating the potato blight disease; they sent a man for that. I asked for assistance for cattle improvement, and they have given us assistance ; as far as I am concerned, I have nothing to complain about.

24904. They have been of substantial help to you in the matter of research?—Yes.

24905. In your printed evidence, you refer to the great depredation by wild animals in this Province?—Yes.

24906. Have you any experience of the superiority of the Coimbatore canes as against jackal attacks?—We have already introduced Coimbatore canes and we are trying them in our Jorhat farm, but the *tana* variety seems to be more immune from jackals.

24907. On account of its harder skin?—Yes.

24908. *Prof. Gangulee :* The *tana* variety comes from Bengal?—Yes.

24909. *Sir James MacKenna :* What about cattle improvement? Has the question of improving the buffaloes been taken up by this Province?—No, but we have made a preliminary inquiry about buffaloes by deputing one of our officers.

24910. What is the number of buffaloes, roughly?—In 1925 there were 212,000 male buffaloes and 239,000 cow buffaloes.

24911. What is the number of bullocks?—The number of bullocks in 1925 was 16 lakhs, the cows 17 lakhs and the young stock 15 lakhs.

24912. So that oxen predominate very largely?—Yes.

24913. Have you considered the question of improving the buffaloes?—It is rather a pity that the local breed of buffaloes is disappearing. As the jungles are being cleared, they are also disappearing.

24914. *Sir Henry Lawrence :* What makes them disappear?—They are not used to living in the open country. They want marshy jungle to live in. These herds of buffaloes are good milkers and they generally keep them in the jungle. Now our jungles are being cleared up. Year after year the Eastern Bengal emigrants are taking up land and it is very difficult now to keep that kind of buffalo.

24915. *Sir James MacKenna :* Do your large landholders take any particular interest in cattle-breeding?—No.

24916. Just one last question about co-operation. Do you use your co-operative stores as a means of disseminating improved seeds and things like that?—Improved seeds were distributed through the societies and so also were implements.

24917. Is that an increasing business?—It is increasing. We started these societies only a year ago and the total value of supplies during last year amounted to Rs. 10,000.

24918. Is any particular interest manifested by district officials, as apart from non-officials, in the operations of the Agricultural Department, officials such as Deputy Commissioners and Sub-divisional Officers?—The Deputy Commissioners of the hill districts and particularly those of the Naga Hills, Garo Hills and Lushai Hills are in charge of the agricultural operations themselves.

24919. So they do take interest?—In the plains they do not take much interest.

24920. That is probably because you have got a small department which is not very much in the public eye?—Yes.

24921. *Prof. Gangulee:* You have a Development Board in this Province?—Yes, we started it a few months back.

24922. What is the constitution of this Board?—I am on the Board; there are two officers of the Agricultural Department, two officers of the Industries Department, two officers of the Co-operative Department and the rest are non-officials elected by the Local Legislative Council.

24923. What is its function?—The function of the Board is to advise with regard to all activities of the three departments.

24924. So, it is merely an advisory body?—Yes.

24925. And you are on the Board?—Yes, I am the Chairman of the Board.

24926. Returning to the Agricultural Department, you said you have four farms in this Province. I am not clear in my mind as to who conducts the experiments on these farms? Who is in charge of the experiments?—There are different kinds of work. For instance, in the Upper Shillong farm there is potato cultivation and in the Titabar farm there is rice cultivation. Then the botanical portion of the work is under the Botanist who has got subordinate officers in each farm; the botanical work is done by him through these subordinate officers.

24927. Take, for instance, the Upper Shillong farm. You carry on certain experiments with potatoes. Who is in charge of that? Who plans out the experiments and records their results and so on?—The Deputy Director is in charge of that. The farms are directly under the control of the Deputy Director.

24928. And you have got two Deputy Directors?—Only one at the present moment.

24929. With regard to the method of demonstration, I am not quite clear in my mind as to what methods you actually follow when you say you demonstrate on the cultivator's own land?—Each demonstrator is given a certain group of villages and in that area he has to demonstrate. Each demonstrator may have 20 or 30 demonstration plots within that group. In one plot he may be demonstrating rice, in another plot he may be demonstrating sugarcane and in another plot something else. In one plot he may be demonstrating simply the preservation of manure and in another he may be demonstrating the growth of fodder crops.

24930. What are the qualifications of these demonstrators?—They are generally educated in the vernacular and they undergo a year's training on one of our farms.

24931. When they do their demonstration work, is it supervised by anybody?—It is supervised by the Inspector and the Superintendent and also by the Deputy Director.

24932. Chiefly by the Agricultural Inspector?—Yes.

24933. You have got 15 Agricultural Inspectors and they supervise the demonstration work of these demonstrators?—Yes.

24934. Have you followed up your demonstrations in any particular area? For instance, one season you demonstrate. Do you follow up that demonstration in the next year?—Yes.

24935. So there is continuity and also concentration of work?—Yes.

24936. With regard to the machinery for the distribution of seed, you said you have got the co-operative organisation through which you distribute seeds?—Yes.

24937. That only applies to the members of the co-operative societies?—The seeds are also given to non-members. The difference is that the members of the societies get them at the price fixed by the Agricultural Department, while to the non-members they are allowed to sell at a small profit.

24938. Do I understand that this distributive machinery helps the small cultivator?—It helps the small cultivator.

24939. Does he get the seed?—He gets the seed and he has this advantage that he does not pay cash for the seed. The society advances the money and he has to pay the value of the seed after the harvest is over. That is the great advantage in distributing seed through the society.

24940. With regard to these farms, do you keep an accurate account for each group of cultivation?—Yes.

24941. Do you publish these accounts?—They are not published now but we used to publish them.

24942. So you are now in possession of certain data with regard to the farm economics of units of cultivation in different areas?—Yes.

24943. In this Province, I think there is a great deal of scope for fruit cultivation. Do you agree with that?—Yes.

24944. I find that as early as 1885 you had a garden plantation of oranges?—Yes.

24945. You had a fruit garden called La Chaumiere garden and on that garden the work has now been abandoned; is that the position?—Yes.

24946. Why has this garden been abandoned?—Because the Legislative Council refused to vote supplies for it.

24947. What was the motive behind that?—I do not know; but the Legislative Council refused supplies and so we had to abandon it.

24948. So it is now leased to a private person?—Yes.

24949. Supposing the Assam Government should want to carry on fruit farming again, have you got any record of past experiences and the results of past experiments?—We have got the records and the present lessee has got all the records of the Shillong fruit garden here.

24950. So these past experiments are not lost, you have them on record and can utilise them?—As a matter of fact, we have even now two or three more fruit farms under the department. We have one orchard in Haflong and there are some other orchards in the hills under the management of the Deputy Commissioners.

24951. You have no horticulturist in charge of these farms?—We have a Fruit Inspector.

24952. What education has he had?—He is a graduate of the Nagpur College. He had some special training in orange culture at Nagpur.

24953. You are carrying on experiments with oranges?—We are trying to make budded grafts.

24954. While we are discussing this fruit question, may I know if there has been any decided improvement in the packing of fruits?—It is very defective. Both the packing and the method of transit are very defective.

24955. Are you paying any attention to that?—We have not been able to pay much attention to that because the packing and other things are done by the traders themselves.

24956. You say in your note that a large number of people are migrating from Eastern Bengal and are settling down permanently in this Province. What assistance do you give to these settlers?—You mean from the department?

24957. Yes?—From the department they got seeds whenever they ask for them. For instance, they require largely the improved variety of jute. They have come from Bengal and in Bengal probably they were getting their supply of seed from the department; they want the same thing done here.

24958. They seek your assistance?—Yes, and they are starting societies among themselves also.

24959. They are all *bhadralog*? They belong to the educated class?—They are all small cultivators, mostly Mahommedans.

24960. On what conditions do they come and settle down here?—They can get land simply by squatting. They have not got to apply but they have to clear a patch and at the time of annual settlement the officer comes and simply records the land.

24961. There is no permanent right in the land?—Until the next resettlement they get only annual leases as they do not stick to one place. They clear a patch of jungle and cultivate it for two or three years, and if they find the land suitable they stick to it; otherwise they move to another plot.

24962. Are you now referring to the practice of *jhuming*?—*Jhuming* is not done by the plain people but it is done by the hill people.

24963. What kind of farming do these emigrants practise?—They cut down the reeds and pick up the stems and then they cultivate.

24964. They do not acquire land from the Government or from any other authority?—They occupy Government land.

24965. They are mostly Mahommedans?—Yes.

24966. Illiterate?—Yes; all illiterate.

24967. Wholly illiterate?—Yes; entirely illiterate.

24968. You have about 18 million acres of culturable waste, I understand?—Yes.

24969. What is the nature of that soil?—A large part of it is marshy, requiring to be drained ; it is fit for jute and also mustard in the winter.

24970. With regard to communications in this Province, river communication is the chief means?—It is the chief one in the Surma Valley. But in the Assam Valley road communication is more important. Of course we have got the Brahmaputra river, but the smaller rivers are not fit for navigation throughout the year.

24971. You have emphasised rightly in your note the need of storing natural manure. I think you are referring to cowdung?—Yes.

24972. Are any experiments being made to show the cultivators how to preserve this important manure?—Yes; we have had covered manure pits made in many centres.

24973. With regard to animal husbandry, you say you have, in this Province, professional breeders who are Nepalis. Do they visit your breeding station?—No; they live far away.

24974. Are you in touch with any of the professional breeders?—I have visited some Khutis to find out what they do.

24975. You have some data as regards their methods?—Yes; I know their methods; they are not amenable either to advice or anything else. They are not under our control at all.

24976. One question with regard to marketing. You say that the Marwaris are in your markets, and that they have a net-work of organisation and deal with agricultural produce. What is the chief produce they deal with?—They deal with all the produce that is exported, *viz.*, rice, paddy, mustard, jute, potato, etc.

24977. Fruits?—By fruits I mean oranges; they do not deal with oranges.

24978. You have no co-operative sale societies in this Province?—No.

24979. You think there is a great deal of scope for them?—Yes; but they require expert business management, and how can I start them?

24980. *Mr. Calvert :* The Director of Land Records has given us a note suggesting that fragmentation of holdings is a considerable evil in this Province. Have you yourself made any special enquiry in the villages on this point?—I have not made any special enquiry but I had been to places where the population is rather dense and holdings are small. I have seen that myself. It is not a general evil; it is confined only to the districts of Sylhet and Gauhati as far as I know.

24981. In Sylhet, where you have small holdings of 4 or 5 acres, in how many different places would those 4 or 5 acres be scattered, 14 or 15?—Say, 10 to 20.

24982. It is quite a serious evil?—Yes, it is quite serious.

24983. And do you not consider it feasible to undertake consolidation?—I think it is possible; the only thing is we are under-staffed. With the necessary staff I shall be able to take up the work not only in Sylhet but also in the Assam Valley. My opinion is that consolidation should be started at once.

24984. In discussing co-operation, you say that a considerable number of members join societies merely for the sake of co-operation; not to borrow?—Yes.

24985. Does it mean that there is nothing mutual between these two sections of members of the society?—I refer in this particularly to the Assam Valley where it is very noticeable. In the Surma Valley, the practice

is more or less akin to that of Bengal; only the borrowers join the society. In the Assam Valley, they think that if they do not join the society they will be rather looked down upon.

24986. But do they themselves get an economic advantage from their membership?—Those who do not borrow, do not get much advantage; but still they take up unlimited liability.

24987. On the question of economic enquiries you say, "Such enquiries will be largely suspected and I do not think that very reliable information will be collected." Is that information based on your experience or is it a mere opinion?—This Province being a temporary settled and ryotwari one, the people always suspect such enquiries and they think that such enquiries will lead to some enhancement of land revenue. That is why I say that any sort of economic enquiry will lead to suspicion in the minds of the cultivators.

24988. That is a pure theory and it is not based on experience?—Yes; I have not started any enquiry myself.

24989. You said, I think in reply to the Chairman, that you had one Assistant Registrar and nine Inspectors?—Yes.

24990. What are the qualifications of the Assistant Registrar?—He is a Sub-Deputy Collector.

24991. Is he a graduate in economics?—No; he is a graduate in science, a B.Sc.

24992. Is he a student of economics?—He has been in this department for the last four or five years and during that time, of course, he has studied economics to a certain extent.

24993. And the nine Inspectors?—They are all graduates.

24994. In economics?—No, not necessarily in economics; some of them are graduates in economics, but all are not.

24995. From what class are they drawn ? Are they drawn from the actual cultivating class?—No; they are all of the *bhadralog* class.

24996. So practically your staff is of a different class from the co-operators?—But they are in touch with the actual agricultural classes, of course.

24997. But they are of a different class?—Yes.

24998. Do you think there is complete sympathy between the staff and the co-operators?—I think there is; but I think they require training in agricultural economics.

24999. Do you have any method such as a course of lectures for keeping your staff up to date?—No.

25000. Do you test the knowledge of your staff at all?—I have just now proposed that they should undergo a departmental examination in rural economics.

25001. At present you have no special class?—No.

25002. Have you got a good library?—Except the library in my office there is none else.

25003. Is it an extensive library?—Fairly extensive with regard to co-operation; but then Agricultural Inspectors are supplied by the department with all the co-operative magazines that are published in India.

25004. But do you insist or take any measures to insist that your Inspectors regularly study new books on co-operation?—I have no means of insisting on that; but of course, I supply them with new books and magazines and their knowledge is tested when they answer the audit notes.

25005. Who does the audit?—The Audit Inspectors.

25006. Government-paid Inspectors?—Yes.

25007. Do the societies pay audit fees?—Yes.

25008. Those fees go to the Government?—Yes.

25009. Is the whole of the audit fee expended on audit?—The Inspectors do the audit as well as the inspection and the whole of the audit fee is spent on the Inspectors' pay.

25010. Is your Provincial Bank audited by your staff?—Yes, it is audited by my staff; we have got a Provincial Auditor for that; he is the only man in the audit staff who does the audit of the Provincial Bank and all the Central Banks.

25011. What are his qualifications?—He is an Accountant and he was trained in co-operative audit work in Bengal.

25012. He is not qualified under the Companies Act?—No.

25013. Is there any system of super-audit?—Yes; super-audit is done by the Assistant Registrar and by myself.

25014. Do you find the audit reliable?—Yes; I think it is reliable; so far we have not been able to find many mistakes in audit.

25015. To what extent have you any system of educating your members systematically in rural economics?—The Inspector sometimes goes and collects the members and delivers lectures to them during the course of his inspection; that is the only method.

25016. If, for instance, there is a society and a suggestion is made of putting a cess on the export of agricultural produce in order to finance the Agricultural Department, would they be able to discuss that intelligently?—I think they would protest against it.

25017. Could they discuss it intelligently?—I do not think so.

25018. Could they point out the fallacy?—I do not think they would be able to do it; they would simply take it as another form of taxation.

25019. Would they know who would pay it?—Yes; they know they are going to pay it ultimately; they know that at least.

25020. Is any attempt being made to study grasses in Assam?—You mean fodder grass?

25021. With a view to laying down land to pasture?—No.

25022. Has anything been done in Assam to lay down proper pastures?—No; only certain pastures have been reserved, that is all.

25023. I mean by pasture selected grass being put in in the place of wild grass?—No.

25024. With regard to your land mortgage bank, you say it is financed by shares and deposits; for what term are these deposits held?—Now the shortest period is five years.

25025. Are you getting a fair amount of five-year deposits?—Not much; they intend to reduce the period to three years, but the period of repayment is ten years; that is the trouble.

25026. Can an individual be a member both of a village primary society and of your land mortgage bank?—Yes.

25027. He can borrow from both?—Yes; but he will borrow from the co-operative society for agricultural purposes, whereas the land mortgage bank is not meant for that; it is for debt redemption, improvement of land and so on.

25028. Does the village society have any say in the matter of getting a loan from the land mortgage bank?—The by-law is that when a member of the village society wants a loan from the land mortgage bank a reference will be made to the society before issuing the loan.

25029. What is the liability of the land mortgage bank?—The liability will be half.

25030. Limited liability?—Yes; half will be uncalled; that is what I understand; half will remain as reserve liability.

25031. What security are you taking in your land mortgage bank?—Immovable property. The by-law is that money can be advanced up to 50 per cent of the value of his immovable property.

25032. The whole of his property?—No, the property offered.

25033. You do not insist on his mortgaging the whole of his landed property?—No.

25034. Do you take personal security in addition?—No.

25035. What will happen if a man fails to pay his instalment?—It will have to be recovered from the property.

25036. You take over the land?—Yes, the land will be put up for sale and if nobody purchases, the society will have to buy it.

25037. In your note, you say that of the 12 lakhs of capital in the movement about one-third, say, 4 lakhs, is owned; that 4 lakhs is available for long-term loans?—Yes, it is available.

25038. In Assam, you have the system of recovering arrears as arrears of land revenue I think?—No, it is under the Public Demands Recovery Act, only on dissolution.

25039. Only on liquidation?—Yes.

25040. Do you find that power valuable?—No, it is not satisfactory.

25041. Do you recommend this compulsory collection through the Collector in the case of liquidation?—In case of liquidation I do; as a matter of fact I am revising the Co-operative Societies Law, and I have already submitted a Bill in which I have provided that power in case of liquidation.

25042. Not in the case of bad debts?—No.

25043. *Mr. Kamat:* You hold three posts?—Yes.

25044. Is it a permanent arrangement that one man should hold three posts, Director of Agriculture, Director of Industries and Registrar of Co-operative Societies?—This has been going on since 1923.

25045. I want to know whether it has been decided by the Assam Government that this is to be a permanent arrangement?—So far it is a permanent arrangement.

25046. Do you think a man who holds these three posts can do justice to all the three departments?—Provided he has a sufficient and adequate staff of experts, I do not think it is very difficult.

25047. In the long run, is it sound economy?—It ensures co-operation of the three departments much better than any other way that I can see.

25048. Supposing a separate officer were appointed to be the Registrar, a full-time Registrar of Co-operative Societies, would not the movement benefit?—I agree with you there, and as a matter of fact probably we shall have to do that, because the societies already number a thousand.

25049. If therefore the societies are to progress and multiply in the interests of the ryot, you think a full-time officer would be beneficial?—Yes.

25050. Roughly what would be the establishment expenditure per month of a full-time Registrar with a subordinate staff?—That will have to be calculated, because he would require a separate office, office staff and all that.

25051. But it would not exceed Rs. 3,000 to Rs. 4,000 per month, roughly speaking?—No; it would not exceed that.

25052. It means that a full-time Registrar of Co-operative Societies would cost about Rs. 48,000 to Rs. 50,000 per annum to the Government?—Including his staff, of course, it would be more than that; there would be his staff of Inspectors and Assistant Registrars.

25053. Would it not be a good investment for this Government if they spent Rs. 60,000 more for the promotion of the co-operative movement in this Province?—In my last report I have already suggested that, that the Registrar should be whole-time now.

25054. Has your suggestion been rejected, or what?—I do not know; I think they are thinking of having a Deputy Registrar, but I could not tell you definitely on that point because it has not yet come up to me.

25055. They want to give you merely a Deputy Registrar?—Yes, I think that is the idea.

25056. Will you please tell me how much time you can devote to industries as Director of Industries?—Very little. As Director of Industries I sometimes go and see the technical schools that we have got and I also sometimes have to see peripatetic weaving demonstrations, but I can find very little time.

25057. But during your time, have you really considered the question of initiating a single industry in Assam?—I have been in the Industries

Department ever since the creation of the department, and all these technical schools and peripatetic parties have been established by me. Previous to that there was nothing.

25058. That is inspection work; I want to know whether you have considered the problem of initiating a new industry which might be carried on in this Province?— You mean a large industry?

25059. Certainly?—Of course, we tried to initiate one large industry, the paper industry, in Assam, but it failed. Beyond that we have not started any other large industry.

25060. Unless the officer who is the Director of Industries possesses scientific and technical knowledge, do you think he can do justice to that task?—He cannot; the needs of the Province are such that probably Assam requires about twenty chemists to study different possible industries.

25061. So that this system of combining the positions of Director of Industries, Director of Agriculture and Registrar of Co-operative Societies is nothing more than a nominal arrangement; you do nominal work as Director of Industries; is that correct?—I simply do the inspection and organisation work, the administration work.

25062. Have the Assam Government considered whether this work could not be done by some other officer in addition to his own work?—The idea of the Assam Government is that the Director of Industries should confine himself to cottage industries which are subsidiary to agriculture, and that larger industries should be left to themselves. I have nothing to do with the tea industry even.

25063. You told us you were not in charge of the lac industry?—No, I am not.

25064. That is considered to be a major industry, is it?—No, it is no doubt a subsidiary industry, but the difficulty is that there is no expert to do the work.

25065. It seems to be anomalous that even this so-called subsidiary industry is not in charge of the Director of Industries?—Besides lac, there are other subsidiary industries which might be developed but which are not being developed for want of men and money.

25066. Then would it be correct to say that although you are in charge of these industries, owing to want of men or money nothing has been done with reference to subsidiary occupations?—Except handloom weaving and sericulture.

25067. In the matter of handloom weaving, will you kindly tell me what has been done by your department?—We have three weaving schools and three peripatetic weaving parties under a Textile Expert; we are introducing fly-shuttle looms; we have, as a matter of fact, introduced a very large number of fly-shuttle looms.

25068. Have you done anything with regard to poultry keeping?—No.

25069. Have you done anything with regard to bee-keeping?—With regard to bee-keeping also we have not done anything.

25070. With reference to your demonstration work, do you know there is a feeling prevalent amongst cultivators that when you say a particular experiment is successful from the financial point of view they suspect your accounts; is that feeling common in this Province?—I do not think there is such a feeling. There is a feeling that, if land is made to yield more, probably the land revenue will be increased; there is a feeling of that sort.

25071. No, I am not referring to that. Your demonstration work, to be really successful, must show better results financially in crop yield than the cultivator obtains by his own methods?—Yes.

25072. But, at the same time, you must keep the expenditure on a level with the expenditure of the peasant?—Yes.

25073. When you show the peasant your expenditure, does he scrutinise the whole thing, and is he satisfied that your accounts are correct?—Yes, he is satisfied; otherwise he would not take up the method. For a year now we have not been concentrating so much on methods as on better seeds, and the fact that there is a demand for these seeds goes to show that he has calculated everything and finds our seeds to be more paying.

25074. With equal expenditure the seeds give better results?—Yes.

25075. That is the net result of your demonstrations?—Yes, the net result with regard to seeds, and I might mention also with regard to implements; for instance, the sugarcane crushing machine has been largely in demand.

25076. *Prof. Gangulee:* Who introduced those machines?—We introduced them; we had them made specially and now we are getting them prepared at Calcutta.

25077. *Mr. Kamat:* With regard to these implements and the demonstration thereof, what are the different implements you demonstrate from place to place?—We demonstrate mostly the sugarcane crushing mill. We have not been successful with other implements; they are not taken up.

25078. You have not been able to make the improved ploughs popular?—No; because the ploughs are too heavy for the cattle.

25079. The improved ploughs are unsuitable for the cattle of this Province?—Yes, unsuitable.

25080. And therefore you have given up the idea of introducing them?—We have given up the idea of ploughs.

25081. Then you do not want an Agricultural Engineer or a man who can devise or change the designs of implements?—No, I have already said that is a matter which should be studied by a special officer with reference to Assam conditions.

25082. With reference to what other implements?—With reference to all implements; there must be a study as to what implements would be suitable for the climate, for the soil and for the draught animals of Assam.

25083. With reference to the depredations of jackals, have you attempted any method of co-operative fencing or anything of that sort?—No, it has not been tried. Jackals do damage mostly to the sugarcane crop, but the sugarcane crop in Assam is not permanently grown in one place; that is the difficulty with regard to fencing.

25084. The result at present seems to be this, that although you say the Coimbatore varieties of cane are good for this Province, you do not introduce them or popularise them merely because of the jackals?—Our experience is that Coimbatore canes are not so resistant to jackals as other canes.

25085. The jackals are apparently neutralising the work of Coimbatore?—They are; they are neutralising the benefit to be derived from all the improved varieties of cane.

25086. Have you concentrated your mind on combating the jackal trouble?—The only way is to distribute a kind of sugarcane which cannot be damaged by jackals.

25087. You say the co-operative movement has failed in some places because of the large sums of money being issued as *taccavi* loans?—No, I do not object to the issue of loans; I object to wholesale remissions.

25088. With reference to agricultural indebtedness, you say one of the causes of borrowing is payment of land revenue and rent. Is that a serious problem here?—Yes, some borrow to pay land revenue or rent to their landlords.

25089. But are a large number of persons driven to borrow owing purely to the necessity of paying land revenue?—Not a large number; it is one of the causes of borrowing.

25090. But is it a general cause or quite an exception?—It is more or less general.

25091. You are not in favour of legislation with reference to fragmentation of holdings. Will you kindly state the reasons why you think legislation would be undesirable?—Because I have not been able to find out what manner of legislation would be effective.

25092. But if legislation were framed by some person of ability, you would not be opposed to it as a matter of principle?—No, I should certainly not be, provided it is feasible.

25093. If somebody devised a Bill which was feasible, you would not object to it merely on the ground that it was legislation?—No, I would not object.

25094. Turning to Government assistance to minor industries, you are in favour of abolishing the lac duty. Will you explain how that would help the general interest of the taxpayer?—At present we are levying a lac duty, but we are doing nothing to improve the industry. If we are not going to do anything for the industry, the duty should not be realised; that is my opinion.

25095. You do not want this duty, because it is not being spent on the lac industry?—That is the point. Also the duty falls heavily on the industry; the price of lac is very fluctuating.

25096. Do you mean that the lac industry suffers merely owing to this duty?—Not merely owing to the duty, but the duty is also a handicap to the industry.

25097. If the duty were abolished, do you think the lac industry would so prosper that the Province would benefit?—The duty brings in about two lakhs of rupees.

25098. You say there are very few people in Assam who are landless. Is that the reason why they do not go to the tea plantations as labourers and the tea gardens have to import their labour?—The tea-garden labourers are called "coolies," and the Assam cultivators do not want to be called "coolies."

25099. But economically, would they be better off or worse off by going to the tea gardens?—Economically they would earn a good deal more if they went to the tea plantations.

25100. If they care to go to the tea plantations, they will earn much better money?—Yes. They do not want to go as permanent labourers; even as daily labourers very few of them go.

25101. Could you give me a comparative idea of how much they can earn if they remain in the fields and how much if they go to the tea plantations?—If they go to the tea plantations, they can earn double of what they earn by staying at home.

25102. It is the mentality of the people which keeps them poor?—Yes.

25103. On the question of general welfare work in the rural areas, you complain that there is lack of interest on the part of non-officials in this Province in rural reconstruction work. That is because this Province is generally backward in education; is that the idea?—I do not know if that is so; but people, whom you may call politicians, never go to the villages except during the elections.

25104. And they do not interest themselves in the village work?—They do not.

25105. How many colleges have you in this Province?—Two.

25106. And a large number of graduates coming out every year?—Yes, large of course compared to the population.

25107. What do they aspire to?—Some of them aspire to Government service; some take to professions as, for instance, law.

25108. It seems, therefore, that public opinion is backward in this Province?—To a certain extent it is backward.

25109. *Rai Bahadur R. M. Das:* You say something about demonstration farms. Have you got demonstration farms in this Province?—We have no demonstration farms.

25110. Are you going to have any in the near future?—The Development Board have suggested the establishment of demonstration farms in every district; that will depend on Government finding the money.

25111. Are you not very much handicapped in your work for want of Government demonstration farms?—I think I have already said that we want demonstration farms, the object being to show to the people that agriculture is also paying, that is, to make them understand that manuring and better method of tilling will pay. At present, our experimental farms cannot be demonstrating centres because we incur a lot of expenditure on them.

25112. You have demonstrations carried on in cultivators' own holdings. Are any difficulties experienced in having such demonstrations in cultivators' fields now?—The demonstration plots in cultivators' fields are very small, but in a demonstration farm it might be possible to show on a larger scale the use of improved implements, for instance, tractors.

25113. Are not the cultivators often reluctant to accept your seeds?—They are reluctant, and we have to give them seeds free; when they find the seed is good after trial, then they come in for it.

25114. Do not your officers find that the cultivators generally assign the worst plot of land for your seeds?—That is a fact. The cultivator's holding is small, and he cannot afford to risk an experiment on a part of his holding; so generally he sets apart the worst portion of his land for the experiment.

25115. Is the sowing of your seeds taken up after the cultivator has finished sowing his own seed?—That is also generally the case.

25116. So that your seeds do not get a fair trial in the cultivators' fields?—Our demonstrations in cultivators' own fields do not always get a fair trial.

25117. So, the result is often poor?—It is not often poor. The demonstrations are not a failure everywhere; they are, I think, generally successful in spite of the drawbacks.

25118. But your seeds cannot get a fair trial in the cultivators' fields?—Not in every case.

25119. Supposing you had a demonstration farm of your own, you could have demonstrated your seeds much better than you have done in the cultivators' fields?—I would not abolish demonstration plots when I get demonstration farms. I would have demonstration farms in addition.

25120. What do you think of the idea of guaranteeing the cultivators against any loss they might incur in having your seeds tried in their fields?—It is in a manner guaranteed though not on paper; it is understood.

25121. Do you actually make up any loss the cultivator suffers?—No; so far we have not made up any loss. There has not been any demand for any compensation.

25122. What seeds are most in demand in this Province?—Jute and paddy seeds, potatoes and sugarcane setts.

25123. What arrangement have you got to produce each kind?—We produce some in our farms and some we get through selected cultivators.

25124. What do you mean by selected cultivators?—I mean cultivators whom we can trust to keep the seed pure. From them we get supplies by purchase.

25125. Do you grow all the potatoes you supply from the Shillong farm?—We grow only a small percentage; the rest we get from cultivators in the Khasi Hills district.

25126. How do you certify the purity and superiority of the seeds if you do not grow them?—It is difficult to certify in the case of potatoes grown in so many different places, but as far as possible our Inspector goes and sees the crop when it is growing.

25127. Are you aware that the members of co-operative societies in the Surma Valley are reluctant to buy your seed potatoes because they are found to be unprofitable on account of the high percentage of rottage?—The difficulty is the transport from the hills to the Surma Valley. In the Assam Valley it is easy. The difficulty of transport to the Surma Valley is very great and the seeds rot before they reach the Surma Valley. That is why our seed depôts also incur losses.

25128. From where do you get your jute seed and sugarcane setts?—The jute seed we get now mostly from two private farmers who have taken up farming on a large scale in the Kamrup district with motor tractors and improved machinery, and are growing improved seeds. We are getting our supplies of jute seed mainly from them, but sometimes we get seed from Bengal. The *tana* sugarcane we get from Bengal, and the other varieties we are growing in Jorhat; we also get them from cultivators.

25129. How do you certify about the purity and the superiority of the seeds if you do not grow them under departmental supervision?—Of course there is difficulty in certifying the purity. When distributing these to the cultivators, no certification is necessary.

25130. What is the best possible arrangement which can be made to grow better sugarcane setts, jute seeds, and paddy seeds in this Province?—The establishment of seed and demonstration farms will go a great way to meet this difficulty.

25131. Where do you get your supplies of pulse seeds from?—Pulse seeds we generally get from Bihar, but we are not distributing much.

25132. How do you certify their purity and superiority?—There is very little demand for pulse seeds. The same is the case with regard to tobacco. We get them from Bihar from the Department of Agriculture.

25133. Do you aim at a profit in distributing superior seeds from the seed depôts?—No ; we do not aim at a profit ; but we want if possible to defray the cost.

25134. Are your officers under the impression that they must anyhow make the seed depôts profitable concerns?—No. It is not the idea to make the seed depôts profitable; the *Agricultural Handbook* states that, in fixing prices, only the actual cost should be taken into consideration.

25135. You do not make any profit?—We do not want to make any profit.

25136. Do you not have any instructions that there should not be any loss?—They are asked to avoid loss as far as possible.

25137. You say that no irrigation has been necessary in this Province. Referring to the Surma Valley, from which I come, is it not necessary for the improvement of the soil in the Valley, that steps should be taken to facilitate the drainage of water-logged areas, the re-excavation of silted up *khals*, the excavation of branch irrigation channels provided with sluices and the erection of embankments where such works are found to be necessary?—They are necessary in Sylhet, because drainage is unsatisfactory for the great part of the year.

25138. You consider that the water-logged areas in the district of Sylhet should be drained off?—Yes, for the improvement of health and for the improvement of the soil also.

25139. There are also silted up *khals* in the Surma Valley which need re-excavation?—I do not know very much about *khals*.

25140. There is also some difficulty about irrigation in the Sunamganj sub-division of the Sylhet district?—That I have already explained. I have said that lift-pumps will be quite successful, though we have not tried them yet.

25141. Do you not consider that the erection of embankments in certain areas is necessary?—Yes.

25142. Do you know that in Bengal there is an Act called the Bengal Lands Improvement and Sanitary Drainage Act? Insanitary swamps are drained off, and it not only improves the health of the people but also the cultivation; it gives facilities to the cultivators to cultivate swampy lands after they are drained off. Are you aware of that Act?—I am not aware of it.

25143. Have you got any Sanitary Engineer in this Province?—Not at present.

25144. Do you think one is necessary?—I could not tell you; we had one for sometime.

25145. Has there been any chemical analysis of the soil of any district?—When we had a Chemist, there was some analysis.

25146. Was the result of such analysis published?—Yes, the results of the Chemist's work have been already published.

25147. Are they published in the vernacular or in English?—With regard to the liming of soils, the results were published in the vernacular as well as in English.

25148. Are the bulletins of your department issued in English or in the vernacular?—They are published generally in three languages, English, Bengali and Assamese.

25149. In your bulletins, is the weight of the produce given in tons and pounds, or in maunds, seers and chataks?—Generally, in the vernacular it is given in maunds and chataks and not in tons, but in English it is given in tons.

25150. Is it a fact that some of your honorary correspondents have complained about this?—I do not remember.

25151. You have said something about the Khanapara cattle farm. Is it going to be started for improving the breed of draught bullocks only?—Yes.

25152. Is it not necessary that the breed of your milch cow should also be improved?—It is necessary.

25153. What arrangements are you going to make for the improvement of milch cows?—Other cattle farms will be necessary, but for the present we want to begin with draught bullocks.

25154. As regards transport, is it a fact that sometimes the cost of taking a maund of potatoes from Shillong to Gauhati exceeds the value of the commodity paid to the grower at Shillong?—It is so just now, because the price of potatoes has come down; it is Rs. 1-8-0 a maund and the freight to Gauhati is more than that.

25155. Is that not due to the levy of an exorbitant tax on the motor lorries which take the material down to Gauhati? Does not the cost of conveyance absorb a large proportion of the value of the commodity?—Yes, the freight is too high.

25156. Have you got a definite programme for the expansion of the co-operative movement in this Province?—We have not got any definite programme that so many societies will be opened every year or anything like that, but we are progressing and at a steady rate, I should say.

25157. How many co-operative societies have you got now?—The number just exceeds 1,000.

25158. Do you remember for how many societies the Maclagan Committee recommended a separate Registrar?—(One thousand).

25159. You think the time has come for the appointment of a separate Registrar?—Yes.

25160. Do you consider your present staff quite adequate?—No, it is not adequate.

25161. How many Assistant Registrars have you got?—Only one.

25162. Is he in charge of a division?—Yes.

25163. Is not your Assistant Registrar an officer of the Subordinate Civil Service?—Yes.

25164. Are you aware that in other Provinces such officers belong to the Provincial Civil Service?—In some places they belong to the I.C.S. In Bengal, I think it is so. I think the Deputy Registrars are I.C.S. officers in some Provinces, but mostly they are Provincial Service officers.

25165. Your Assistant Registrars are Divisional Officers?—Yes.

25166. Do not your Divisional Agricultural Officers belong to the Provincial Service?—The Superintendents of Agriculture belong to the Provincial Agricultural Service.

25167. For efficient and proper control of the staff, do you not think that the Divisional Officers such as the Assistant Registrars should be recruited from the Provincial Civil Service?—I suggest they should be appointed from the Provincial Civil Service. I think Provincial Civil Service Officers will make better Assistant Registrars.

25168. What auditing staff have you got?—There is only one Auditor paid by Government.

25169. When was he appointed?—I think he was appointed in 1920.

25170. Has not the working capital and volume of business of Central Banks and other non-agricultural societies more than doubled during this period?—Yes.

25171. Do you think the present auditing staff quite sufficient?—The audit of primary societies is done by the staff of Inspectors.

25172. I am speaking not of primary societies, but of Central Banks and non-agricultural societies such as stores?—The work has not doubled; it has of course increased.

25173. Will you please refer to your memorandum; you say it has doubled?—That refers to all kinds of societies, not the Central Banks alone; Central Banks and non-agricultural societies have not exactly doubled.

25174. The number has considerably increased?—Of course it has increased.

25175. What about the working capital and volume of business?—That has doubled; I was thinking of the number of societies.

25176. I was asking you about the capital and volume of business?—That has more than doubled.

25177. Do you not think that the present staff of one Auditor is inadequate?—One Auditor is now inadequate.

25178. Inadequate to deal with the growth of the business?—Yes, we have to increase the number of Auditors.

25179. Your audit work is done by your Inspectors?—Yes.

25180. In a year, how many days do these Inspectors spend on tour?—On an average, about 220 days.

25181. Will you kindly look up your report, and say how many days they toured last year? I think you said it was 187 days?—Last year, the number of days spent on tour was rather less.

25182. How many days was it?—The average would be something like 150 days last year.

25183. How many societies have been allotted to each Inspector for audit and inspection?—It varies in different localities. In the Surma Valley one Inspector has 183 societies, another has 136 societies, and a third has 121 societies; in the Assam Valley, the charges are 107, 170 and 125.

25184. Do you not think that at least three days are necessary for the thorough overhauling of the accounts of a rural society including the time spent in transit?—That depends on the size of the society. With the smaller societies, even two of them might be audited on the same day, but a large society will require at least two days to audit.

25185. After doing the audit work, is there any time left for the Inspectors to do any propaganda or educational work with a view to the inculcation of co-operative principles in members of co-operative societies?—At present, they have very little time, but we have submitted a scheme to Government for the increase of the number of Inspectors; this increase has been spread over a certain number of years, and we hope to get the first instalment next year.

25186. Do you not consider that the stereotyped work of audit could be done more cheaply by a staff of Auditors who may not be so highly qualified and not so highly paid as the Inspectors?—That was the question which was discussed by the Local Government and the Government came to the conclusion that possibly audit by Inspectors would be more reliable than audit by a poorly paid staff.

25187. Under the present arrangement, as you say, your Inspectors do not find sufficient time to do any propaganda or educational work?—The only remedy is to increase the number of Inspectors.

25188. In the scheme which you have proposed you say that 75 societies should be allotted to each Inspector?—Yes.

25189. Your Inspectors spent about 200 days on an average on tour in the interior?—Yes.

25190. If three days be allotted to each society, then do you think there will be time left for doing any propaganda or educational work after auditing all the societies?—With only 75 societies in their charge, I think they will have sufficient time.

25191. But they will require about 225 days to audit these societies?—They can do a lot of propaganda and educational work along with audit.

25192. Do you not consider that educating the members of co-operative societies is the most important work of the Inspectors?—Yes.

25193. Do you think it is being done now?—During audit they meet most of the members because it is during the audit that they have to verify the loans.

25194. Does not all this work take a long time?—It does.

25195. Does he find sufficient time to do any educational work?—Not at present, as I told you before.

25196. Can he find time for any organisation work?—Nowadays organisation work is to a large extent done by the Central Banks.

25197. Have they got sufficient staff to do it?—The Chairman of the Central Bank or the Secretary of the Central Bank is an Honorary Organiser appointed by the Government.

25198. Can you say how many societies your Honorary Organisers organised last year?—Last year 66 societies were organised by the Honorary Organisers.

25199. Do you consider that satisfactory?—Out of 138 new societies registered last year, the Honorary Organisers organised as many as 66 which is nearly half the number.

25200. How many Organisers have you got?—Twelve.

25201. So, on an average, they organised five societies in a year. Do you consider that to be a sufficient expansion of your movement?—I am satisfied with the amount of work done by these Honorary Organisers considering that they have also got to attend to their own work. Some of them are business men ; some of them are pleaders and some of them are educationists and they have got their own work to attend to. What assistance they have been able to give is, I think, quite satisfactory.

25202. The Chairman inquired from you about the Surma Valley Co-operative Organisation Society. You know that they have entertained a staff of teachers?—Yes, I know that.

25203. Do you know that this society is languishing for lack of funds? How much do they get from Government?—Last year they got from Government Rs. 1,000. I hope they will get a similar amount this year. They are also getting a grant from the Local Boards.

25204. Do you think they are well in funds?—They are not; it depends on the number of members they enrol.

25205. Do you not think that Government should help this society more liberally?—Government have already granted a sum of Rs. 1,000 and the idea is to watch the progress and developments. If the work is done on right lines Government will certainly encourage this society, as far as possible, with money.

25206. You say that primary education is not free in this Province. Do you know that no fees are paid by the boys who attend primary schools?—Fees are not charged but I think primary education is not quite as free as it is generally understood to be.

25207. *The Chairman :* You told me that the reverse was the case. What is the explanation?—They have to buy books and paper. Everything is not quite free.

25208. Are there any other charges?—No fee is charged.

25209. So it is only the expense on books and paper that they have to incur?—Yes.

25210. *Rai Bahadur R. M. Das :* The teachers are fully paid?—They are paid by the Boards.

25211. You said that rural reconstruction work under present circumstances cannot be left entirely to patriotic non-officials. Do you know that there is such an organisation as the Sylhet Social Service League?—I know there is such a League.

25212. Have they taken up rural welfare work?—They have taken up the work, no doubt; but they have not got sufficient men to go to every village.

25213. Do you know they have got a whole-time preacher who goes out and gives lantern lectures on sanitation and hygiene?—They have got a preacher but for a population of 26 lakhs one preacher is not enough.

25214. He may not be enough, but they have made a small beginning. Do you know they have got some night schools?—I do not know of any night schools. My idea is not to underrate the work done by these non-officials but I say that without Government assistance the work cannot be done properly. That is the reason why I want the active support of the District Officer.

25215. *Sir Thomas Middleton :* I think your department was established in 1882?—Yes.

25216. It has got a long history. You have published annual reports; have you reviewed your progress in any special reports?—I have given a very brief resumè in the memorandum *

25217. What I mean was whether at any time during this period there have been periodical reviews?—No.

25218. So, for our information we must go to the annual report or to your special memorandum?—Yes.

25219. You point out that you require at the present time a Chemist, an Entomologist, a Mycologist and Livestock Expert but that your funds do not permit of the appointment of these men. Now, in view of the shortness of funds, which of them would you select first. I want you to place them in order. Which do you think is most necessary for work in Assam?—We want a Livestock Expert and a Mycologist.

25220. Why do you want a Mycologist specially?—Because there are a lot of plant diseases.

25221. Which diseases have you got in mind especially at the moment?—The potato disease, the disease of betel-nut, and the diseases of coconuts.

25222. Are betel-nuts and coconuts important groups here?—Yes.

25223. So these are the two experts that you would select first?—Yes.

25224. You have informed us that your demonstrators are not of the type that you would desire. What salaries are these demonstrators paid on appointment?—They get Rs. 20 and rise to Rs. 50.

25225. What are the schoolmasters in primary schools paid in Assam?—They get on the average from Rs. 14 to Rs. 20.

25226. So that relatively your demonstrators are well paid as compared to the teachers in primary schools?—Yes.

25227. You train these demonstrators by giving them one year's course on a farm?—Yes, they have to be maintained at the farm by means of stipends.

25228. How old are they when you appoint them?—They are generally about 18 years of age.

25229. Are these boys of 18 with one year's training fit to go out and advise, instruct and demonstrate to the cultivators?—I think they are not. My idea is that they are not satisfactory.

25230. What I want to get at is whether it is the want of training or the poor salary that makes them unsatisfactory?—It is want of education and not want of training. If, for instance, they receive some sort of elementary agricultural instruction in the middle school, they will be better qualified after training on the farm to become demonstrators.

25231. Is it want of training or want of money that prevents you from getting the right men?—We might possibly get men from agricultural colleges if we had money.

25232. Of what age would these men from agricultural colleges be?—They might have a separate course in an agricultural college for demonstrators.

25233. Do you think these students from agricultural colleges would be fit to demonstrate to cultivators?—They would have to undergo training on the farm for one year.

25234. You expressed the view that we ought to have in Assam some teaching in agriculture, at least in the middle schools?—Yes.

25235. How many middle schools have you got in view?—I should rather start with one school in each district.

25236. How many districts are there in Assam?—In the plains there are eight districts.

25237. You point out that you could not provide these middle schools with school farms because of the cost?—Yes, a school farm would be more costly than a building.

25238. You also indicate that you require a certain number of demonstration farms in Assam. Would it not be possible to combine these two objects?—It would be possible.

* Not reprinted : Preliminary Memorandum on Agriculture and Rural Economy in Assam prepared for the Commission by the Assam Government.

25239. How many acres of potatoes are grown in Assam?—We can give you figures only with regard to improved potatoes because potatoes are grown largely on the hills for which we have no statistics.

Are there 200,000 acres? I only want a very rough idea. Your total area under cultivation of vegetables is something like 450,000 acres. If you cannot find the figure, please do not trouble to look it up. Let us have the figure later on.

25240. You are now providing 2,500 maunds of improved seed potatoes. How many acres will that quantity plant each year?—That also I will be able to supply.

25241. In any case you are supplying seed for only a minute fraction of the land under paddy cultivation?—Yes.

25242. *Dr. Hyder:* What are you doing with regard to the hill tribes in the matter of agriculture?—We have got our agricultural staff, the Inspectors and Demonstrators, also in the hill districts.

25243. Among the tribes which are under British administration?—Yes, and also outside British administration; the Khasi Hills district is practically outside.

25244. How far is the improvement in agriculture in the Khasi Hills due to the efforts of your department and how far to the Welsh Baptist Mission?—They have not done anything, as far as I know. The potato cultivation is entirely due to the efforts of our department.

25245. With regard to the extraction of lac, is not the duty entirely on produce which comes from the Government forests?—No.

25246. It is on lac extracted from private forests?—Yes, as well as from private lands.

25247. Then with regard to this subsidiary industry of *agar*, do you know what that is?—Yes; it is entirely from the Government forest.

25248. What are you doing to revive that? I find from the Reports of the Census Department that it was a very important industry at one time?—At present, there is very little demand for *agar* essence. Originally the demand came from Turkey and Arabia.

25249. What is the customary law of inheritance among the Khasis; they do not subdivide?—The inheritance is through females.

25250. There is no sub-division of the family holding?—There is no sub-division as far as I know.

25251. The youngest girl inherits, is that it?—Yes.

25252. Cannot you improve your milk-yielding areas in the hills; you have got plenty of pasture land, have you not?—That is what we are trying to do in the Upper Shillong farm.

25253. How much will it cost to spray an acre of potatoes with Bordeaux mixture?—I have not calculated that; probably the Deputy Director will be able to tell you.

25254. It is well within the cultivators' means, is it?—Yes; it is probably within their means; but then when they have got large areas possibly they cannot manage to spray the whole lot.

25255. *Mr. Hezlett:* As regards the general organisation of your department, I think the main difficulty in Assam is the question of funds and all these departments have been placed under you because the revenues cannot afford to have each subject under a different officer?—Yes.

25256. So unless we can increase our revenues or raise a big loan, we cannot afford to have all the officers who are really necessary?—Yes.

25257. You admit they are necessary?—Yes, but the whole question depends on money.

25258. So that we have here one officer for all the departments while in most of the other Provinces the three departments are separate with possibly an expert officer in charge of each?—Yes; besides I think the idea was to carry on the work under one man.

25259. Yes; the subjects are allied to each other and in that way there is a certain amount of advantage?—Yes.

25260. And you also want to put the District Officer in more direct charge?—Yes.

25261. That is because you are short of expert staff and because you think the influence of the District Officer will help your departments?—Yes. My idea is also to increase his influence.

25262. And give him really definite control, not merely being an advisory officer? As regards land records the District Officer is definitely in charge of the work in his particular district. Do you think that the District Officer should be definitely put in charge of the work of your departments in his own district? Do you go so far as that?—Not necessarily; but I want his active assistance.

25263. But if you want his active assistance, do you not think that you must give him also some definite control or definite authority?—Some control can be given provided he has got time; but possibly he will have to be relieved of some of his judicial duty, I think, to some extent.

25264. My theory is that the District Officer, having nothing to do now with local Boards and Municipalities (which are now being run under their own non-official chairmen) may have some time now to devote to village reorganisation, co-operative credit, agriculture and that sort of thing. He can do more than he is doing at present?—My opinion is that the Rural Self-Government Bill which has been passed should have been more comprehensive; it should have included not only rural sanitation and medical health but also all other activities.

25265. Would you make the District Officer more or less a departmental head of that organisation?—Yes.

25266. So you would definitely put him in charge of the village reorganisation work including agriculture and co-operative credit as far as possible?—Yes.

25267. *Mr. Calvert:* On the non-technical side?—Yes.

25268. *Mr. Hezlett:* I see that the net cost of your own Department of Agriculture is about 2 lakhs of rupees, that comes to about 1.1 or, say roughly, 1 per cent of the revenue of the Province. Do you think that is a fair percentage to expend on agriculture?—I think we ought to spend a little more.

25269. How much do you think would be a fair percentage of the total revenue of the Province to spend on agriculture?—It is very difficult to say; there are other demands also; but the present expenditure might be doubled if possible.

25270. I understand that some of the Provinces spend 3 or 4 per cent, though Bengal spends 1 per cent. Do you think 5 per cent is too much to spend on agricultural?—I do not think it is too much.

25271. I think 90 per cent of our population is engaged in agriculture?—Yes.

25272. And you think that even 5 lakhs will not be too much to spend in expanding the agricultural resources of the Province?—Exactly.

25273. Of course you have no suggestions as to how this extra money is to be raised, whether it should be by cutting down expenditure on other departments or by raising increased revenue or by increase in taxation for this particular purpose?—I cannot say; increase in taxation will probably be unpopular.

25274. It will be unpopular in the Council Chamber, you think?—We are already levying a cess on tea for instance, and we do not get any part of it for Assam.

25275. You get nothing from the export duty on tea?—No.

25276. But the export duty on lac?—We do not get it either.

25277. That does not come to the Local Government?—No; that goes direct to the Government of India.

25278. That also goes to the Government of India?—The duty on lac is a forest head of revenue and I think it goes to the Government of India. I am not sure.

25279. *Mr. Kamat:* Lac duty is Imperial revenue?—Yes.

25280. *Sir Henry Lawrence:* What is the amount of duty on tea paid by the Assam Government?—From 50 to 60 lakhs of rupees.

25281. *Mr. Hezlett:* You are aware, I think, that a commercial company was established two or three years ago to carry on lac cultivation on a commercial scale and that it has failed?—Yes.

25282. Can you give us any definite reasons why this experiment has failed?—The principal reason is that the price of lac has gone down as the demand for the commodity has been reduced. There is less demand for lac now. Again the Assam lac is not fit for shellac. It used to be largely used in the manufacture of gramophone records as far as I know and now there is a decreased demand for gramophone records on account of the advent of the listening in apparatus.

25283. I think you asked for a Forest Officer to help you?—Yes.

25284. You do not get any help from the Forest Department?—No.

25285. And your staff could not take up the work and so nothing has been done?—That is the position.

25286. Lac is chiefly grown in the Mikir Hills I understand?—Yes, and the lower portion of the Khasi Hills.

25287. They are all having a bad time this year on account of the slump in price?—Yes.

25288. I see the Rev. Nichols-Roy estimates that 4 lakhs of maunds of potatoes were exported from the Khasi Hills this year; I think the actual figures were, three lakhs went down by motor lorry, and he estimates that another lakh went down by cart. He makes a general complaint that owing to the high rates charged by the motor company the development of the industry in this district is being hampered. There is a definite season for potatoes here. What was the price of potatoes during the season?—During the season it was between Rs. 4 and Rs. 5 a maund.

25289. But now the price has gone down to about Rs. 1-8-0 a maund?—Rs. 1-8-0 or Rs. 1-12-0 a maund.

25290. That is because the potatoes have missed the market?—Yes, there is now less demand in Calcutta.

25291. Other markets are supplying the demand?—Yes.

25292. Our market here is in August, September and October?—Yes.

25293. Then the Burma potatoes come in; unless the Shillong potatoes get down by the end of October they will not pay?—The Assam Valley potatoes are also coming in now.

25294. That is the local demand?—Yes.

25295. That is one reason why the Rev. Nichols-Roy says the actual freight on potatoes down to Gauhati is now more than the price in Shillong?—Yes.

25296. But that refers only to the slack season?—Yes, but I should think the advent of mechanical transport has increased the production of potatoes in the Khasi Hills.

25297. Yes, that is the general opinion, I think. As regards manure, I see you are using water-hyacinth ash in Sylhet for potatoes and jute?—Yes.

25298. You know the water-hyacinth is spreading all over the Sylhet district; every little puddle, tank or stream is covered over with water-hyacinth?—Yes.

25299. Do you not think use might be made of this as a manure, either by digging it in or burning it and so obtaining the valuable potash which it contains; the cultivators have next to their own fields a very valuable manure?—It could be used; as a matter of fact, we have been demonstrating the use of the water-hyacinth as a manure to many cultivators, but it has not been taken up; I do not know why.

25300. It seems to be possible, does it not?—It is a possibility, of course.

25301. So that it could be used for manure instead of being a pest as it is at present. It fills up the waterways, though it does good by filling up the low country by collecting silt?—It is not considered a very good manure.

25302. That is a matter for investigation, but it seems that more use might be made of it. My friend Rai Bahadur Ramani Mohan Das complained about the floods in Sylhet and wanted more irrigation channels, sluice gates and that sort of thing. It is a fact that Sylhet is surrounded by the rainiest tracts of country in the world?—Yes.

25303. And it is a very low-lying tract with very little outlet?—Very little fall.

25304. I think the town of Sylhet is 40 feet above sea level?—Yes.

25305. So that the question of drainage is a very difficult one?—Very difficult.

25306. The problem of prevention of floods in Sylhet and the Surma Valley generally is also a very difficult one for that reason. Are you of opinion that anything practical could be done?—I cannot suggest anything definite, unless an engineer is deputed to study the whole question; it is a very difficult question.

25307. You have read the report of about 1916 of the Chief Engineer, Mr. Oertel?—Yes.

25308. With regard to animal husbandry, we have in Assam semi-wild animals, such as the *mithan* which is I believe an ox?—Yes.

25309. And the Assam buffalo?—Yes.

25310. Do you not think more use could be made of the *mithan* and the buffalo in developing new breeds of animals for this Province?—Yes; a separate buffalo farm is required in a convenient locality where crosses might be made between the wild buffaloes and local buffaloes.

25311. Do you not think it would be desirable to take special measures to preserve the Assam buffalo?—It is very desirable.

25312. He is a very fine animal from the bone point of view and the female is a good milker?—Yes.

The Chairman : Do they remain in a wild state?

25313. *Mr. Hezlett :* The wild bulls come in from the forest and cover the tame cows; that has kept up the standard of the breed to a great extent?—In doing so they are liable to contract rinderpest and die.

25314. That is a matter which will have to be dealt with by the Veterinary Department. Could you produce a good specimen of the Assam buffalo for the Members of the Commission to see?—Yes, at Jorhat.

25315. *The Chairman :* What colour is the skin?—Usually black.

25316. *Mr. Hezlett :* Of course, there is the other type of buffalo, the Bihar and Orissa type?—Yes.

25317. He is an inferior beast altogether?—Yes, he is quite inferior to the half bred; the half bred is called the *dhumassa;* that also is a good animal.

25318. You think we should develop the buffalo?—Yes.

25319. As being more suitable to the climate of Assam possibly than the cow or the ox?—I think we ought to have a buffalo farm.

25320. Then with regard to the *mithan?*—The *mithan* was tried in Upper Shillong farm I think some time ago; it is good for bone but not for milk.

25321. It is not a good milker?—No.

25322. But for ordinary draught purposes it is a very fine animal?—Yes. It is suitable for the hills, not for the plains.

25323. You do not think it would live in the plains?—No.

25324. It might be possible to produce a cross between the *mithan* and the cow which would be a useful animal?—Yes.

25325. With regard to fruit, in this Province, do you not think we have done rather too much towards growing apples and pears and that sort of fruit and not done enough on the growing of stone fruit?—I agree with you there.

25326. Do you not think plums, apricots and peaches do well in the Khasi Hills?—They do.

25327. They are more or less indigenous?—We have first to work with the indigenous fruits like oranges.

25328. Oranges are the chief fruit, I agree, but instead of apples and pears, I think we should go in for stone fruit such as plums, which do very well here?—Yes.

25329. And apricots and peaches which can be grown very well here?—Yes.

It would be better to devote our energies to stone fruit than to such fruits as apples and pears as the place is possibly not cold enough for them.

25330. Have you any special theories about agricultural education?—I have already said that we must make some sort of a beginning, at least in the middle schools.

25331. You think we should start in the middle schools and have some sort of vocational middle school?—Yes.

25332. To teach agriculture, industry and the literary side as well?—Yes. Of course, there we are also held up by want of funds.

25333. *Sir Thomas Middleton:* You told me some time back that the quantity of seed potatoes which you had to distribute was sufficient only for a very small fraction of the area grown in the Khasi Hills?—Yes.

25334. Do you select the men to whom these seed potatoes go?—We select the men from whom we get these seed potatoes.

25335. My question was, do you select the men to whom you sell or supply seed potatoes?—No, we do not select; we sell seed potatoes to those who want them.

25336. You supply those who will buy them?—Yes.

25337. So that you cannot say whether your selected seed falls into the hands of careful growers?—No, that, of course, we cannot say.

25338. Is the potato trade of the Khasi Hills mainly a seed trade or mainly for food?—Both for seed and for consumption.

25339. Can you give us any indication of the relative importance of the two?—I think for consumption it is about three-quarters and for seed about one-quarter; that is my impression.

25340. You told us that the price at the beginning of the season was Rs. 4 to Rs. 5 per maund?—Yes.

25341. Was that for food or for seed?—For food.

25342. Which fetches the highest price?—The bigger potatoes which are used for food fetch a higher price.

25343. But does not the immune selected seed which you send out command a higher price?—They do not go to the market at all. The ordinary cultivators also sell seed potatoes to the Marwaris; the Marwaris take them down to the plains and sell them as seed potatoes. We give out seed potatoes to selected cultivators, get the whole crop of seed potatoes from them, and then distribute them.

25344. I follow that, but you grow and distribute about 2,500 maunds?—Yes.

25345. And you sell them to any purchaser of seed?—Yes.

25346. Can you say whether these potatoes command any higher prices than the ordinary potatoes of the country when they are grown by the cultivators?—No, there is no such distinction as to price, I think.

25347. *Mr. Hezlett:* Is there a bigger yield?—Our seed potatoes germinate better and they probably get a better yield; that is why they pay us a little higher price than they pay to the ordinary traders.

25348. *Sir Thomas Middleton:* I can understand the cultivator buying from you at a slightly higher price in order to get selected potatoes?—Yes.

25349. I want to know whether the people to whom he sells recognise that his potatoes have been selected and are worth a higher price?—I think not.

25350. Is the practice of *jhuming* very common on the Khasi Hills?—In the Khasi Hills, the terraced cultivation has spread and *jhuming* is practised on only a small scale now.

25351. It seemed to me common in the neighbourhood of Shillong?—It is cultivated in parts.

25352. I was referring to the cutting of the forests?—They are cutting of course to clear the land.

25353. Is it a common practice to cut and clear before growing potatoes?—Yes.

25354. They grow potatoes for how many years?—For three or four years.

25355. Then what happens?—They leave the soil and allow it to recuperate.

25356. As regards statistics, you tell us that you have accurate figures for six temporarily settled districts?—Yes.

25357. But you have no accurate figures for the Hill districts or for the two permanently settled districts of Goalpara and Sylhet. Are these two districts important rice-growing areas?—They are very important.

25358. How do you manage to estimate the acreage under rice in these districts?—It is purely guess work.

25359. I see in 1923 you reported to the Government of India that you had 4,596,197 acres under rice in Assam. When you guessed the acreage in these two important districts, I do not see how you came to specify "197"?—We get accurate figures from the other districts although from these two districts we might have had only round figures.

25360. Are there any considerable areas in any of these two districts which are not permanently settled?—They are all permanently settled.

25361. So that you cannot proceed by taking samples of the districts?—It has not been tried. In those two districts, they have got *chowkidari* panchayats.

25362. In this figure of 4,596,197 acres under rice, how much would you put in as a guess of the acreage in those two areas?—Sylhet, 1,787,000 acres; Goalpara, 420,000 acres.

25363. That is, nearly 50 per cent of the area reported on is really based on a guess?—Yes.

25364. And you have no means of checking that guess at all?—There are no means of checking it.

25365. How do you fix on the figure at 1 million rather than 500,000?—That is reported by the Deputy Commissioner.

25366. There is, I suppose, a survey and the total area is known?—Yes.

25367. And the guess is that rice occupies a certain percentage of the total area; is that the method?—I think that is the method.

25368. Then the same difficulty arises in the case of your livestock statistics?—No. Livestock is counted head by head.

25369. In these two districts also?—Yes.

25370. By what officer?—By the *chowkidari* panchayats.

25371. *Mr. Hezlett:* You said that the whole of the districts of Goalpara and Sylhet is permanently settled. That is not quite correct?—No, the whole of the Jaintia Parganas has to be excluded.

25372. And other parts of Goalpara. The whole district is not permanently settled?—No.

25273. In those temporarily settled areas of Sylhet and Goalpara do we get accurate figures?—Yes.

25374. So that you have some check over the reports of *chowkidars?*—By comparison with temporarily settled areas we can check them to some extent.

25375. *Sir Thomas Middleton:* That is the point I wanted to get at. You have got sample areas?

Mr. Hezlett: We have some areas for which we get accurate figures, but they are not typical.

25376. *Sir Thomas Middleton:* Yet they help the District Officers in making a reasonable guess?—Yes.

25377. *Sir Henry Lawrence:* Is there a cadastral survey?—Not in the permanently settled areas.

Mr. Hezlett: In the temporarily settled areas we have settlements every twenty or thirty years. A resettlement is going on now.

25378. *Sir Thomas Middleton:* Would it not be desirable that some warning should be given of the fact that these very important figures are largely estimates?—They are much more valuable than those for the Bengal districts. They are under the same difficulty in Bengal.

25379. *Prof. Gangulee :* Has the Development Board at any time discussed the question of finding funds for the Agricultural Department?—The Development Board had only one sitting.

25380. Since its formation?—Yes.

25381. The matter has not been taken up?—They have suggested many improvements, but they require money to be carried out. For instance, they have suggested demonstration farms in each sub-division.

25382. They have suggested a programme, but have they not suggested any means to get the extra funds?—No.

25383. What is the attitude of the local bodies towards agricultural development, especially with reference to cattle-breeding?—In some places the Municipalities and Local Boards maintain bulls, but not in all places.

25384. They have an income from cattle-pounds?—They have.

25385. To what extent?—The whole of the pound income is made over to the Local Boards.

25386. Do you think it is about one lakh?—I could not tell you the figure. The Municipalities have their own pounds.

25387. They do not earmark that particular income for cattle improvement?—No.

25388. There are no farms in this Province run by educated or middle-class men?—Yes, there are.

25389. Are there large numbers of them?—They have come into existence only recently.

25390. What is the average area they have?—There is a farm of about 300 acres in Atharikhat in Darrang district.

25391. Run by *bhadralog*?—The largest farm is of 300 acres; it has got three tractors besides other implements. They also run a poultry-farm.

25392. Do they go in for commercial farming?—Yes, for jute, sugarcane and mustard.

25393. *The Chairman :* Have you a great variety of weights and measures in use in the Province?—We have the same weights and measures throughout the whole of the Province.

25394. Would you be in favour of any attempt to standardise weights and measures?—I think the same weights and measures are in use in the whole of this Province. Probably there cannot be a standard for the whole of India.

25395. Would you favour that?—I would not.

25396. You think there cannot be a standard?—There cannot be the same weights and measures for the whole of India.

25397. Why do you form the view that there could not be the same weights and measures for the whole of India?—Practically the same weights and measures prevail all over Assam; there may be other weights and measures in India which may not be understood in Assam.

Prof. Gangulee : A committee was appointed by the Government of India to consider this question.

25398. *The Chairman :* Within the borders of this Province, have you a great variety of weights and measures?—No.

25399. Do you find that tribes inhabiting neighbouring valleys understand and use the same weights and measures?—They generally use the weights and measures in use in the plains.

25400. Are the local authorities in the Province empowered to allocate any revenue towards advancing the co-operative movement?—No. The local bodies do not allocate any part of their income. I think they are not allowed.

25401. Have you anything which you wish to say as to the local authorities and the powers which they have in matters touching agriculture, and the extent to which they use those powers?—I may say that cattle-breeding is a subject in which they are allowed to spend part of their money. But

with regard to other forms of agriculture, say farms, I do not think they can spend anything.

25402. But you have no criticism or constructive suggestion to put forth in that direction; is that so?—I have made some suggestions with regard to agricultural education.

25403. Nothing else?—There is nothing else which the local bodies can now do.

25404. The Dewan of the Gauripur Raj, Mr. Chakravarty, has put something in his note of evidence, which I think you will like to hear and possibly answer. He is talking about demonstration and propaganda, and he talks of one incident which occurred two years ago after a severe flood in some parts of the Estate, "I asked the Agricultural Department for a large quantity of paddy seeds for loan to tenants to enable them to try a new crop in places where the existing crops had been destroyed by floods. The seeds were supplied and paid for by this Estate and distributed amongst the ryots. In many areas the seeds did not germinate but the Agricultural Department did not refund the price which had to be borne by this Estate. The result is that the ryots lose confidence in seeds supplied by the Agricultural Department and it will now take years to restore the confidence thus lost. This is of course due to the department having no seed stores"?—I think I know of that incident. Probably the failure was due to their trying to grow it too late. They did not try to grow it in proper time. That was what was brought out in the enquiry.

25405. There was an enquiry?—Yes.

25406. What sort of enquiry?—The Deputy Director enquired into it, and it was found that the seeds came too late for sowing. There was delay, of course, in securing the seed.

25407. Who was responsible for the delay, your department or the persons asking for the seed?—They asked for the seed late, and at the same time there was delay in our supplying the seed, because we had to get it from the Sylhet district in the Surma Valley.

25408. I take it you wish you had told them that it was too late in the year for that particular seed?—I wish we had told them that they made up their mind too late to start.

25409. *Sir Henry Lawrence:* Why could they not get the seed themselves?—That kind of seed was not available in their district. It was a kind of paddy which was grown only in the Surma Valley; they asked for it and we had to get it from the Surma Valley.

25410. Where would you say most of your problems lie, in the plains districts or in the hills?—In the plains, not in the hills.

25411. You think this is the right place to have your centre?—This is the headquarters of the Government; I must be here. In financial and other matters I have constantly to refer to Government. I am under the Minister, the Minister is here, and in every matter I have to take his orders.

25412. No doubt you are required to be here as Director. Has there been any proposal to start any experimental farms in the plains?—We have already got experimental farms in the plains.

25413. For particular crops?—Yes.

25414. That, you think, meets the needs of the position?—Yes, and our agricultural laboratory is also in the plains.

25415. Take your Botanist; where is he working?—In the laboratory at Jorhat.

25416. Would you suggest that any addition to your scientific staff should go down to the plains and work there?—I have suggested all the additional staff.

25417. Would you suggest that they should go down to the plains and work there, or would you have a larger staff in the hills?—All of them are in the plains; there is no large staff here.

25418. *Rai Bahadur R. M. Das:* Where is the headquarters of your Deputy Director?—It is at Jorhat.

25419. Where did Mr. Chakravarty live?—He lived in Jorhat, his headquarters.

25420. Does your Deputy Director spend most of his time here?—He has to come here sometimes; there is a farm here, but he had his headquarters in the plains.

25421. *Mr. Hezlett:* You are aware that Government did try to establish a regular measure for paddy called the *don*?—Yes.

25422. They did try to establish this measure all over the Province as the measure for paddy, but it was not a success, it did not take on?—Nowadays paddy is sold by weight.

25423. Not by basket?—It used to be sold in small quantities, and even now it is sold in small quantities by basket measure, the *don;* but when traders like Marwaris purchase it, they do so by maunds and seers.

25424. The Marwaris purchase it by maunds and seers and not by baskets?—Yes.

(The witness withdrew.)

Srijut LAKSHESWAR BARTHAKUR, In-charge Deputy Director of Agriculture, Assam.

Replies to the Questionnaire.

QUESTION 1.—RESEARCH.—(*a*) So far as Assam is concerned, research has not made much progress. Moreover, what work had been done in the line was not commensurate with the expenditure incurred as a good deal of it was either of negative nature or not suited to the real needs of the cultivator or to his mentality. It appears to me that a regular survey of the local and provincial problems on all agricultural matters should have been properly made and their relative value and importance estimated and the prospects of their solution carefully weighed and a plan of work settled. As this was not done, we have had several failures and several projects have had to be abandoned.

The question of research into the scientific value of the indigenous theory and traditional methods of agriculture has not been taken up seriously in this Province.

(*b*) Progress is not being made both for lack of resources and deficient organisation and for want of sufficient and suitable skilled workers. It appears to me that the experts also should have the local experience to be acquainted with the mentality and the real needs of the cultivator and have sympathy for him to know under what difficulties he is to live and work.

(*c*) The following problems appear to deserve inquiry into:—

(*i*) Rice:—

(1) Milling and table quality of the rice varieties selected for improvement.
(2) Feeding-value of their straw as cattle food.
(3) Value of tillering against heavy heads of ears of paddy.
(4) Study of the flora of the rice field in its relation to soil fertility, acidity, etc., and the best means and methods to kill them.
(5) Studies of the water requirement.
(6) Studies as to how seeds from a colder climate and from a richer or heavier soil behave in warmer climate and on poorer soil or *vice versa.*

(*ii*) Oil-seeds, pulses, and fibre crops:—Practically nothing has been done with regard to these crops.

(*iii*) The best method of conserving cattle manure.

(*iv*) Studies to find out a suitable rotation for the typical paddy tracts.

(*v*) Improvement in the design and construction of the common implements so as to increase their efficiency.

(*vi*) Plant diseases:—

(1) Potato blight.
(2) The betel-nut palm disease.
(3) The orange diseases.

(*vii*) Practical campaign against insect pests—such as the use of the Andre Maire Traps.

(*viii*) Intensive studies and investigation into the diseases and pests of the potato crop in the Khasi Hills, which in spite of extensive ravages of the potato blight annually exports 200,000 to 400,000 maunds of potatoes of which a considerable portion is used for seed in Assam and the neighbouring districts of Bengal.

(*ix*) Establishment of seed and demonstration farms in suitable localities, preferably one in each sub-division.

(*x*) Establishment of a few model farms to take up the problems connected with economic farming for middle class men (including poultry, bee-keeping, pisciculture, sericulture, etc., as subsidiary industries). This would serve as an incentive for adopting improvements in agriculture by the ordinary cultivators also.

QUESTION 2.—AGRICULTURAL EDUCATION.—(*i*) *to* (*vii*) I have no experience of any agricultural institution as we have done practically nothing for teaching agriculture academically. The only work done in this line is the training of apprentices for our demonstrators and educating the cultivator through practical demonstrations in his own fields.

It appears to me that, as agriculture is the sole occupation of 85 to 90 per cent of our people, agricultural education could not be neglected. This should be the greatest concern after literacy has been provided for by means of free primary education. But unfortunately, under the existing circumstances, a boy would be sent to a school only with the idea of securing employment for him, preferably in Government service, and everybody even of the cultivating class, thinks that the people know all about agriculture and they have nothing to learn.

It is true that the successful cultivator does his work timely and most of it rightly. But if he had understood the scientific principles underlying all cultural operations and known 'why' as well as 'how' to do he would surely have done much better. But there are larger number of cultivators who are not as successful as the best ones and their ignorance is mainly responsible for the poor result they get. Moreover training with the cultivators who are themselves ignorant would necessarily take a long time and yield the worst results. This could and should be remedied by establishing agricultural schools in rural areas and ultimately agriculturalising the secondary education for the rural mass.

For a beginning, I would suggest that a number of middle English schools should be converted into agricultural schools by modifying the curriculum in the upper three classes and introducing therein both theoretical and practical agriculture with a suitable farm attached to each. The school farms could perhaps be worked by the agricultural students and the produce would help them to meet a part of their expenses.

Such schools, if at all established, could very well be combined with the seed and demonstration farms proposed by the Agricultural Department and they would be financed and managed by the Agricultural Department.

(*viii*) Nature study has its own value but in a country like Assam it is not necessary to lay too much importance to it.

School farms are out of the question unless the school is an agricultural one.

School plots are seldom looked upon as a field for object lesson. As the pupils live away from the school and as they have no personal interest in the work, it appears dull and uninteresting to them.

Under the existing economic and agricultural conditions, I think home gardening of flowers and vegetables would be highly appreciated both by the pupils and their guardians. So this should be encouraged by all means, such as by supplying free seeds, free manure (where necessary) and use

of necessary implements as well as by offering prizes and holding shows in the school premises for the flowers and vegetables grown by the pupils. These shows may very well be combined with other school festivities such as sport and prize distribution ceremony.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(*a*) Practical demonstrations in the midst of villagers combined with timely propaganda have been found to influence the practice of cultivators.

(*b*) Placards on the fields where demonstrations had been successful and propaganda to bring their results home to the cultivators by holding meetings in the locality should increase the effectiveness of the field demonstrations.

(*c*) The best way to induce the cultivators to adopt expert advice would be to present it in an attractive way which could be done only by (1) approaching them through the local influential people and middle class farmers, and (2) proper advertisement either through circulation of suitable literature or any other means.

(*d*) Instances of success:—

(1) Success of improved jute and paddy seeds in the Surma Valley and in many parts of Assam Valley.
(2) Success of the improved sugarcane varieties in localities in Assam Valley where there is no danger by jackals.
(3) Success of bonemeal on paddy in the Khasi and Jaintia Hills.
(4) Introduction of Shillong potato in many localities where potato was not grown before.

Instances of failure:—

(1) Failure of the improved sugarcane from damages by jackals.
(2) Failure of cowpea as green manure for sugarcane.
(3) Failure of the improved paddies, selected in Karimganj farm in Upper Assam.
(4) Failure of bonemeal manuring on paddy to become popular although it was not economically unsuccessful.

QUESTION 4.—ADMINISTRATION.—(*a*) & (*b*) Unlike the richer Provinces like Bombay and Madras, Assam could not afford to be self-contained in the matter of research and technical knowledge. There would, therefore, be decided advantages if services of experts like Phytopathologist, Soil Mycologist, Agricultural Engineer, etc., could be borrowed from the Central Department for definite periods. But the subordinate staff should preferably be provided by the Local Government.

In cases where services of experts are thus lent they should be allowed to work under the Local Government in all matters except in that of co-ordination of the technical matters with that of the Central Department.

(*c*) (*i*) The Veterinary Department's services are inadequate and the Agricultural Department's are still more so. Staff should be increased and adequate funds provided.

Moreover, measures should be taken to make these services more popular.

(*ii*) Railway, steam and motor services, etc.

The interests of the agricultural people do not appear to have received due consideration at the hands of the carrying companies. The following may be mentioned for special consideration:—

(1) The interests of the Khasi potato growers.
(2) The cattle traffic from Bihar into Assam:—
Reduction in fares and expeditious transit and betterment of the wagons used (at present only C.I. wagons are being used) would be of much benefit to the trade.
(3) The special (low) rates prescribed for certain goods and between certain stations should be liberally extended so as to enable transport facilities for all agricultural products and in all places.
(4) Breeding bulls should be carried at specially low rates of fares.
(5) Facilities for the carriage of fruits, vegetables and perishable agricultural products should be increased.
(6) All plants and grafts, etc., should be allowed lower rates than at present.

(*iii*) Roads—

In the matter of roads also the interests of the cultivators do not appear to be properly looked after because they do not know how to raise any organised voice.

Perhaps the nomination of the agricultural officers to local bodies may be of some use to this matter.

(*iv*), (*v*) & (*vi*) The agricultural progress of this Province has not reached such a stage as to requisition the services of the Meteorological Department, Posts, Telegraphs and Wireless for direct agricultural purpose.

Timely information as to great storms, etc., and forecasts of weather will no doubt be of considerable use if properly notified.

Perhaps, supply of information as to the current market rates and their tendency in respect of important staples for sale, *e.g.*, jute, paddy, cotton, lac, potato, may be of some use in giving moral support to the producers in the disposal of their goods.

Publicity to the above may be given by issuing weekly bulletins notified in public places, such as railway stations, post offices, *thanas*, school houses, *kutcheries*, etc.

QUESTION 5.—FINANCE.—(*a*) (1) The activities of the co-operative societies should be extended.

(2) Establishment of land mortgage banks should be encouraged.

(3) The scope of the Agriculturists' Loans Act and Land Improvement Act should be extended and adapted to the cultivators' needs.

(*b*) *Taccavi* loans are unpopular for the following reasons:—

(1) They are usually too inadequate to meet the cultivators' needs.

(2) Very often they are granted only on the joint responsibility of several persons.

(3) At the time of realisation there is much unavoidable hardship caused to the debtors.

To make *taccavi* loans popular there should be provision for adequately helping the needy but solvent and for discrimination in administering the loans.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(*a*) (*i*) The cultivators have to contract indebtedness in order to clear off old debts, to defray expenses of social and religious obligations and ceremonies, to purchase land and property and to meet expenditure necessary for maintenance.

(*ii*) Local moneylenders who are either (1) local people or (2) Marwari *mahajans*.

(*iii*) Very often the debts are contracted at exorbitant rates of interest, far above the paying capacity of the borrower. Sometimes unfortunate and unforeseen mishaps, such as failure of crops, mortality of cattle or long illness in the family of the cultivator, occur and sometimes on account of spend-thrift habits of the cultivator repayment becomes difficult.

(*b*) Usurious interest should be prevented and attempts to circumvent the same should be efficiently tackled. Facilities for redemption of mortgages are likely to be of use.

(*c*) It would perhaps be desirable to restrict sale so as to prevent land passing off to non-agriculturists or non-domiciles. Non-terminable mortgages also should be prohibited.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—This is an All-India problem and a problem mainly for the Legislature, I believe. The evils from this cause are not yet so much felt in Assam but they have begun to appear in certain congested localities. It would be wise to consider it as an important problem for the future.

QUESTION 8.—IRRIGATION.—Irrigation in the modern sense of the word is not of any general importance in Assam. But there is an indigenous system of irrigation which is widely practised in the wet paddy cultivation in the hills and in some parts of Goalpara, Kamrup, Darrang and Sibsagar where with the help of temporary *kutcha* dams in upper regions and

drains and raised embankments, water is carried, sometimes over long distances, and paddy fields are irrigated. There are about 200,000 acres of land mainly under paddy in Assam, irrigated by this system.

No technical advice not even supervision and very rarely financial help has been rendered to these cultivators. Something should be done to help them.

QUESTION 9.—SOILS.—(*a*) (*i*) Drainage is necessary near about village sites where all high-land crops are usually grown. But for want of measures on a sufficiently large scale many localities suffer both from bad sanitation and difficulties in high-land cultivation.

(*ii*) Reclamation of alkali lands does not arise in Assam.

(*iii*) The evil effect of soil erosion due either to flood or rain water is not felt much in the plains. But it is very severe in the hills. Terracing and embankments are tried with good results.

(*b*) Cases of soil improvement in low-lying tracts through silt deposit are occasionally met with. On the other hand, many a good paddy field has been spoiled by road drains passing through it.

(*c*) There are considerable cultivable areas lying waste in Assam. Government should encourage farming on a large scale by granting leases to middle-class men on favourable terms and also by granting land improvement loans on an extensive scale.

Perhaps ranching of cattle will be of double benefit both by improving cattle and by bringing land under use.

As to the reclamation of areas gone out of cultivation, they should be either converted into suitable pastures for the benefit of cattle improvement or brought under cultivation by better cultivation and manuring.

QUESTION 10.—FERTILISERS.—(*a*) For paddy cultivation, which is the main staple crop of the Province, fertilisers are not likely to play any part for some time yet to come. This is mainly due to the fact that most of the paddy fields are self-fertilised by washing from village sites or by flood water and also to the fact that fresh areas are being brought under paddy cultivation.

But in growing sugarcane, fruits and vegetables concentrated manures like oil-cake are more or less freely used and the use of artificial manures is likely to spread gradually. For this purpose, there should be propaganda work and measures to remove the apathy of the cultivator as well as his chronic lack of cash.

As to the application and use of natural manures, there appears to be an immense field for educating the cultivators in the matter of conservation of cattle manure and its use. Assam stands apart in this matter from other Provinces as the use of cowdung for fuel is practically unknown to the indigenous people. The number of cattle per capita is also pretty high in Assam and the total production of cattle manure is consequently large. But very little of this is used by direct application. I would estimate that only 10 to 15 per cent of the total cattle manure produced is utilised, the balance being either washed away or wasted. If all the cattle manure, household refuse including ash, etc., and the vegetable refuse of the homestead were collected under a compost shed in each household, there would be enough manure to push on agricultural improvement to a very large extent. Estimating at five heads of cattle and five persons per household of the cultivating class, the average production of this compost manure of a cultivator's family would be at least 300 maunds per annum. Proper utilisation of this quantity of natural manure should produce an increased crop producing a net profit yield of at least Rs. 100. Thus the enormous cattle manure and compost manure wealth of the Province, 80 per cent of which is now unconsciously thrown away, would amount to a large sum. Thus it would appear that the field for work in educating the agricultural public in their conservation is very wide and any activity, if carried on in an adequately intensive scale, would yield important results.

(*e*) Since 1915 till recently we paid a good deal of importance to demonstrations with bonemeal, flour phosphate on paddy but although the results were not economically unprofitable they failed to be popular with the cultivators except in the Khasi and Jaintia Hills, where bonemeal has become quite popular owing to their inability to get any decent crop without bonemeal.

The main causes of failure of phosphatic manures in attaining popularity in the plains are the following:—

(1) The apathy of the people, no doubt due to want of keen struggle for existence, to anything that is short of an extraordinary or miraculous nature.

(2) Lack of funds and inability to finance as well as want of purchasing facilities.

(3) Their costly nature at least in the first cost.

The usefulness of other artificial manures has not been sufficiently investigated.

(*b*), (*c*), (*d*) & (*f*) These points either do not arise or are not of much importance for Assam.

The foregoing remarks apply only for ordinary cultivation. But in the case of special cultivation, like tea, artificial manures play an important part and are properly appreciated and used. In this Province, there are some 900 tea gardens with 400,000 acres under tea and enormous quantities of artificial manures are consumed.

QUESTION 11.—CROPS.—(*a*) (*i*) The problem of improving paddy, sugarcane and potatoes has been already taken up by the Agriculture Department. Only the staff has got to be increased and experiments on other crops such as oil-seeds, fibres, pulses, *aman* paddy, etc., have to be taken up. For this purpose at least three more experiment stations are necessary.

Production of improved varieties is an important factor in the improvement of agriculture as it is easy to appeal to the cultivator through improved seed because it does not cost much to try it.

(*ii*) Introduction of new crops also are quickly appreciated by the cultivator, if it is successful and pays them to adopt the same.

(*iii*) As a rule, cultivators are accustomed to grow their own seeds of the staple crops. So they would rather get a small supply of the improved seeds free and propagate them themselves than purchase their requirements. This fact must be duly considered in any seed distribution.

(*iv*) Wild animals, *e.g.*, pigs, monkeys, rats, squirrels, hares, deer, elephants and various birds cause lots of damage to all sorts of crops wherever they can. And Assam being a country full of jungles, a considerable area is exposed to their depredations.

To afford help to the cultivators in protecting their crops, adequate provision should be made for granting gun licenses more freely for this purpose. Wherever we agricultural officers go, we receive applications for help in securing gun licenses. If Government are unable to grant an adequately large number of permanent licenses, arrangements may be made for hiring out Government arms for short terms with temporary licenses.

(*b*) The prospects of maize as a rainy season crop on high land and wheat and barley in the cold weather have not been properly investigated in this Province. I think this should be done.

(*c*) The improved varieties of sugarcane, jute and paddy are nowadays extensively grown. The Shillong potato has been introduced in many a locality in Assam where it was not known before and has replaced many less paying local crops. The cultivation of European vegetables also has extended largely through the activities of the Government seed depôts.

QUESTION 12.—CULTIVATION.—(*i*) There is scarcely any room for improvement in the existing systems of tillage unless through improved implements and improved draught animals.

(*ii*) Rotation of crops in the true sense of the word is practically unknown in Assam. Fallowing is sometimes practised generally to give rest to the soil. Owing to the two strikingly different kinds of cultivation—namely, rainy season for the wet paddy on low lands and the dry cold season for the *rabi* crops on high and well aerated land—it is difficult to make a really valuable suggestion. However, the following may be suggested where practicable:—

1. Jute and potato.
2. Maize and *matikalai* or cowpea.
3. Early jute and late *aus*.
4. *Aus* and *sail* paddy.
5. Sugarcane (plant and ratoon) and *arhar*.
6. Sugarcane, plant and ratoon, cowpea and mustard (green manure).

QUESTION 14.—IMPLEMENTS.—(*a*) Although all the implements ordinarily used by the Indian ryot are simple and crudely made, there appears to be some room for improvement in their making. Proper investigation has got to be made into the matter before any suggestions could be made.

Introduction of new implements has got to be made very cautiously. Unless the same are tested as to their suitability to the real needs of the cultivators, good results are not likely to be obtained. This must be done in the Government farms and by the demonstration staff.

(*b*) Before the cultivator can adopt improved implements, there must be improvement of draught animal and improved financial facilities as almost invariably improved implements require higher costs and greater draught power. But in case of very inexpensive and small improved implements, mere demonstration and propaganda will do.

(*c*) Manufacturers are seldom acquainted with real requirements of the Indian cultivator. For this purpose their technical experts must come to the field and study local conditions. It is extremely doubtful whether manufacturers in Europe could cater for the ordinary requirements of the mass cultivators as they require very simple and inexpensive implements because no skilled artisans are available to work and repair them in rural areas. Moreover, their resources are very limited.

QUESTION 15.—VETERINARY.—(*a*) I think the research portion of the Veterinary Service should be under the Central Government, but the ordinary treatment of sick animals as well as the campaign against epidemics should be placed under the Director of Agriculture.

(*d*) There should be permissive legislation empowering the execution to deal with contagious diseases where and when necessity occurs.

QUESTION 16.—ANIMAL HUSBANDRY.—I have dealt with this subject in my Report on Cattle in Assam.

There is a strong contrast between the powerful and heavily-built Assamese buffaloes and the stunted and miserable looking cattle in Assam. The former is superior not only as a draught animal but is also a heavy milker.

The obvious conclusion would be that the soil and climate are naturally adapted rather to the buffalo than to the cow. This question has not received any attention till now and requires to be properly investigated.

(*a*) (*i*) So far as Assam is concerned, one thing appears to me to be by far the most important. It is the prevention of gradual degeneration through inattention to the breeding principle.

In Assam, there is no breeding bull maintained in any system. Stall-feeding is unknown. Cattle are let loose for the greater part of the year. Generally speaking, the bull calves of more robust make and growth are castrated early for the purpose of impressing them into services but the stunted, weedy and miserable looking young bull calves are left entire with the idea of having better looking bullocks when they are castrated later. Thus these weedy bull calves grow up and mate promiscuously in the common pastures and produce more and more degenerated progenies. In this way there is a considerable degeneration, generation by generation. Unless this is stopped, no appreciable progress can be achieved by any measure for cattle improvement.

For the above purpose, legislative measure as well as State help would be necessary as individual efforts would be of no avail even if there were genuine attempts at it. The following measures are likely to produce the desired effect. At least they may be worth trying in a district or two:—

(1) Legislative measure—prohibiting castration of animals by unqualified and unlicensed men. This will be justified at least to prevent cruelty to animals.

(2) Provision for suitably trained village castrators who should be required to work under licenses with rules and regulations and within limited areas. These castrators will be allowed only to use the Burdizzio method or similar methods which will prevent cruelty to animals. The condition of licenses would be that the castrators could not castrate the best few of the young bull calves which will be left entire to sire the village cows but after they have served for a year

or two the same would be castrated by the Veterinary Assistant either freely or at the cost of local bodies. Of course, the services of the village castrator would be paid for by the owners of the castrated animal.

It would perhaps be better to so amend the Cattle Trespass Act as to explicitly provide that the income derived from fees and fines of cattle pounds be earmarked for the improvement of cattle.

(*ii*) Price of milk and other dairy products have gone up so much of late and adulteration of milk and *ghi* has become so common that serious attention has got to be paid both by the public and the State to the betterment of this industry. This question has become more acute in the towns where Municipalities should pay greater attention to the following:—

(1) Keeping of breeding bulls of milking strain to provide for service after castration has been controlled by the means suggested above or any other measure.

(2) Arrangement for growing green fodder, *e.g.*, Guinea grass or affording facilities for the same on municipal lands heavily fertilised by dumping street sweepings or night-soil.

(*iii*) In Assam, people keep many more cattle than they can properly look after and cause great damage to crops by letting cattle loose for the greater part of the year. This practice should be discouraged by active measures while encouragement should be given to the keeping of better classes of animal—

(1) By providing facilities for procuring cows of improved breeds from outside by intending purchasers.
(2) By propaganda work on the benefits of keeping better class of animals and on the art of cow-keeping.
(3) By holding local shows.

(*b*) (*i*) & (*ii*) In all the thickly-populated tracts there is overstocking of common pastures. Specially in the paddy-growing tracts the suffering of cattle knows no bounds during the months of July to November. In many a paddy tract the road sides form the only grazing area during these months and cattle suffer severely.

(*iii*) If people preserved all the available straw and stubble for feeding their cattle, it would have helped them very much in feeding their cattle. But in many places they sell the same on account of the temptation for ready cash or burn them for domestic purpose. But in many cases they do not realise the importance of straw and stubble and do not take the trouble to save them.

Active propaganda is necessary so as to impress the village people with the necessity and importance of saving of stubble and straw.

(*iv*) In the dry season, cattle suffer from absence of green growth on the high-land pastures. This could be particularly remedied by saving stubble and straw. I should think the system of feeding tree fodder as practised by the "Nepalee Khutiwallas" could be of great and extensive use. The following trees are likely to be of use in this respect; and it would be better if regular feeding experiments are carried on to determine their feeding value:—

Tree fodder.

(1) Simul—*Bombax malabaricum.*
(2) Sissoo—*Dalbergia sissoo.*
(3) Bipal—*Ficus religiosa.*
(4) Mulberry plant—*Morus species.*
(5) Shoanlu—*Tetrantheria monopetala.*
(6) Cassava—*Manihot utilissima.*

(*v*) In a Province of very heavy rainfall like Assam, the question of mineral constituent in fodder and feeding stuff seems to be of utmost importance. In the rainy season, cattle suffer very often from looseness of bowels and do not appear to keep as well as they do in the dry cold weather. All that we know from practical experience is that when salt is given cattle keep much better and eat with relish.

In addition to common salt, other kinds of mineral matters as well as phosphoric acid and sulphur compounds are likely to have great effect on cattle nutrition. This subject should afford a fruitful field for investigation.

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I should also think that the biological condition of soil as well as stagnation of water is likely to have considerable effect on the nutrition and health of cattle. This subject also should receive due attention from our scientists.

(*c*) The period of fodder shortage varies according to localities. In higher and drier tracts, it is during February and March, in low-lying tracts during July, August and September and again, in still deeper lying tracts, it is in the junctures of the dry and wet seasons, *i.e.*, in May or June and in October. The fodder shortage lasts for only one to two months at a stretch.

(*d*) The cultivator must sooner or later take to cultivating fodder crops and he should be taught this by suitable propaganda work. The following steps are likely to produce important results:—

(1) To explore the tree fodder resources.

(2) To introduce silage making.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(*a*) If we divide the cultivators into three classes according to the keenness of their struggles for existence and on account of diversities of natural advantages, we would probably get the following figures showing the days of labour on agriculture proper:—

——	In Assam Valley.	In Surma Valley.	In Hills.
1. Cultivators of the well-to-do or flourishing class who depend entirely on agriculture.	240	260	300
2. Cultivators as above but who have subsidiary industries to help them.	180	200	250
3. Cultivators who live a precarious life depending on agriculture alone.	150	180	200
4. Cultivators who live a precarious life and also work as labourers in spare time.	120	120	180

In the Assam Valley, almost every householder has got his homestead land on which he grows some fruits, economic plants such as betel-nut, betel-leaf, bamboo, etc., and vegetables. In many a locality, silk-rearing forms an important subsidiary occupation. The few heads of cattle and goats, etc., he keeps, also help him in either making his life comfortable or in earning some money. He does not spend any money on fuel and he devotes his short leisure hours, when he is not engaged in religious or social duties, in economic work connected with house-keeping.

In the Surma Valley also, the time of the cultivator is occupied in a similar manner except that there is no silk-rearing. In the hills, the life is much more hard as owing to the peculiar system of *jhuming* they have to get new lands cleared almost every year.

(*b*) *&* (*c*) Subsidiary industries may be of two kinds—one contributing to the comfort or improvement of the standard of living of the cultivator and the other yielding him cash return. For the former no special training need be provided but the latter may require proper training and careful development would be necessary. To improve the cultivator's living, he must have some such subsidiary industries as are suited to his tastes and aptitude as well as to the real necessities and possibilities obtaining under his local conditions.

In addition to the subsidiary industries already mentioned (bee-keeping, poultry-rearing, sericulture, pisciculture, lac culture, fruit growing), handicrafts and industries like handloom-weaving, carpentry, blacksmithy, wicker-work, bamboo and cane work, etc., deserve to be considered.

The following are the obstacles in the way of their expansion or adoption:—

(1) Want of facilities for learning them.

(2) Difficulties in obtaining the necessary tools and implements or seeds and materials; sometimes their costly nature.

(3) Lack of facilities for marketing the finished produce.

(4) Lack of finance.

(*d*) Yes. Government should do more to establish and help these industries where there are prospects for them. Starch making from potato from the Khasi Hills, cultivation and manufacture of peppermint oil, either from oranges and other fruits, canning and packing of fruits, utilisation of the paddy husks produced in rice mills for fuel, etc., appear to deserve attention and consideration.

(*e*) Only industries connected directly with the preparation of raw materials to bring them to the marketable condition may flourish in rural areas, otherwise, generally speaking, local conditions in rural areas in Assam would not be suitable to the development of industrial concerns. It would perhaps not be desirable to industrialise rural areas which will greatly disturb the village life and bring in undesirable effects.

(*f*) Yes, by all means; but we should see that no undesirable industries are encouraged.

(*g*) & (*h*) Work of co-operative organisations and village authorities should be widely spread and intensively carried on so as to create a local body of workers for tackling these problems.

QUESTION 18.—AGRICULTURAL LABOUR.—(*a*) If there were a Bureau for supplying necessary information and working as a medium for connection between the demand and supply of agricultural labour, some benefits might accrue to those who need them.

There should be a regular organisation to help people who want to migrate from a congested locality to a tract where suitable lands are available for settlement.

(*b*) The shortage of agricultural labour in the greater part of Assam is due to plenty of cultivable waste land where people can easily migrate.

(*c*) Opening of communication facilities in tracts of cultivable waste lands would greatly expedite the occupation and development of such areas.

QUESTION 19.—FORESTS.—(*a*) This is a question, I think, Forest Officers should be in a position to reply properly. As an agricultural officer, I would like to see more areas being thrown open for grazing. At least such forests as have not been worked properly or are not likely to yield much may be converted into grazing lands.

(*b*) Village grazing grounds and fuel reserves have been of considerable use to the cultivators. These are absolutely necessary under the existing practice of rural life. Wherever possible, increased reserves should be provided.

(*c*) Frequent *jhuming* for cultivation on hill sides leads to considerable soil erosion. To suppress this evil the system of cultivation of the hill people requires to be changed by discouraging *jhuming* and unnecessary firing of jungle.

(*d*) Afforestation is a costly affair and the natural forests, though not very valuable, are yet in existence on a large scale. Consequently protection of forest is of great importance in Assam. Moreover, the soil and climate of Assam are such that there is practically very little land without any vegetation. The only erosion, therefore, takes place on cultivated areas. So afforestation is not necessary in Assam for preventing soil erosion.

(*f*) Constantly grazed areas, whether forest or of grazing reserves, suffer serious deterioration through constant treading of cattle and impoverishment by removal of plant food. Matters may be improved by preventing overgrazing.

QUESTION 20.—MARKETING.—(*a*) The existing market facilities are far from satisfactory. Of the various kinds of agricultural produce that are of commercial importance, rice, *gur*, paddy, oil-seeds, *matikalai*, fruits (specially oranges), potato, cotton, jute and lac require mention. Out of these rice, *gur*, paddy, *matikalai* are consumed within the Province, only some paddy being exported out of the Province. The trade in these article, as is the case with all sorts of trade in Assam, is in the hands of the Marwari traders, who care only for their own profits.

Potatoes form the most important item of export from the Khasi Hills. Its market in Shillong is entirely in the hand of Marwaris and is largely controlled by the demand in Calcutta and the transport facilities

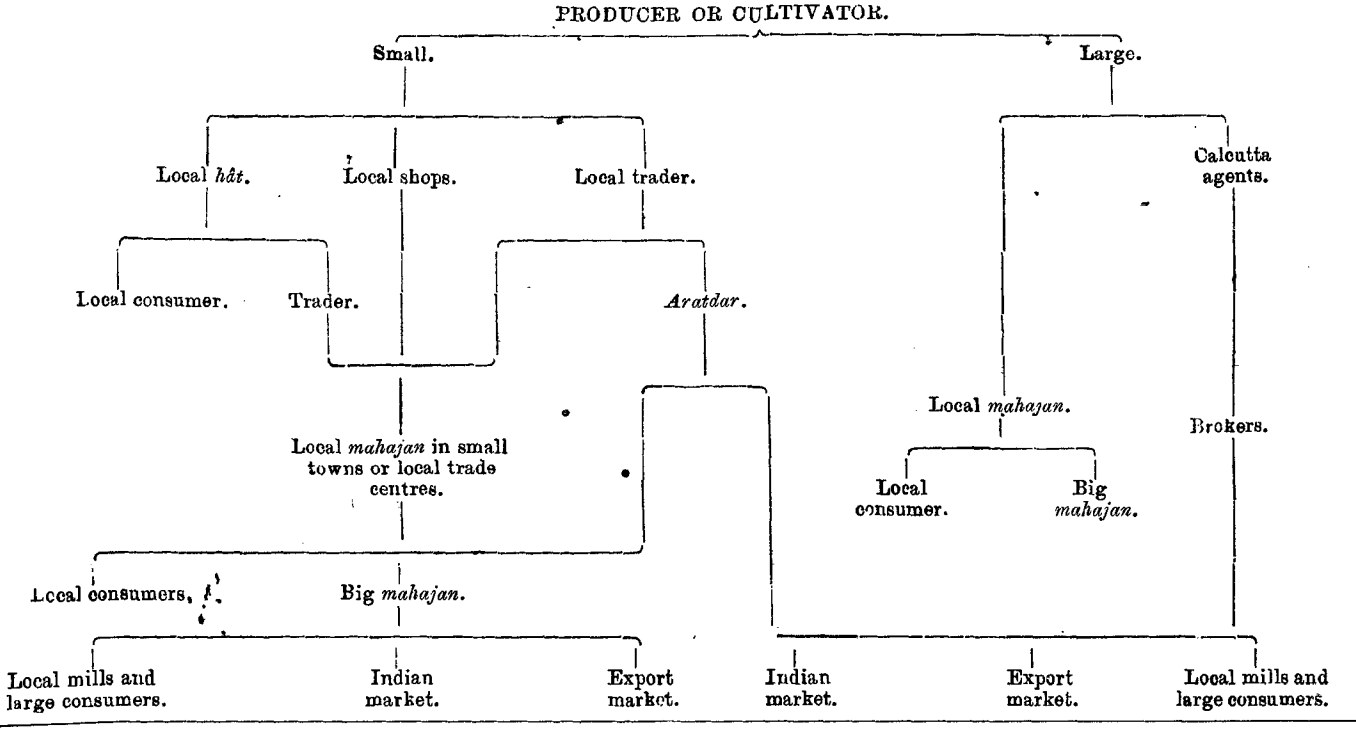
and motor freights. Besides, there are Khasi middlemen to bargain in the disposal by the actual growers. On the whole, the cultivators scarcely get the advantage of the actual market rates.

The market for cotton, jute and lac also is mainly in the hands of the Marwaris and small local traders and there are considerable speculations in these markets. But the producers get little benefit from the market fluctuations.

There appears to be very little that could be done to improve matters and until the mass producers advance in education and learn to stand on their own legs in the matter of organisation and co-operation very little could be done. The principle of co-operative sale and purchase appears to be the only remedy, and active propaganda work for the cultivation of the co-operative spirit should be vigorously undertaken.

(*b*) The existing system of marketing and distribution of agriculture produce are not satisfactory. There are too many middlemen who come in for their share of the profit at the expense of the producer, *i.e.*, the cultivator.

The channels of marketing and distribution from producer to the consumer will be gathered from the chart given below.



Explanatory note.—
(1) *Hât*—a market place where local producers and consumers as well as traders meet once or twice a week for sale and purchase.
(2) *Mahajan*—A merchant; used to indicate moneylenders also.
(3) *Aratdar*—A commission agent.

To the small cultivator there are three ways open to sell his surplus produce:—

(1) He can take them to the market (*hât*) and sell them either to the actual local consumer or to the petty trader who buys them for cash.

(2) He can take them to the village shopkeepers who are usually local people in the Surma Valley and generally Marwaris in the Assam Valley, and dispose them off either for cash or in settlement of accounts with them.

(3) He can wait till some local trader calls at his place and purchases the produce usually at a price very favourable to the trader.

From the local traders or local shops the produce goes into the hands of *mahajans* in important trade centres or towns whence it is sent down to Calcutta for disposal. Usually the local shops have trading connections with the *mahajan* in the towns or trading centres or very often the village shops are branches of the *mahajans* in the town. Moreover, the Marwaris have established a network of trade connections by which even the petty shops in the remotest part of the country are connected with Calcutta firms through two or three intermediaries. Thus the export and import business is well organised; however, the middlemen reap a large profit at the expense of the actual consumers and the cultivators.

Functions of each intermediary and the margin of his profit:—

Local shopkeeper and local trader.—The local trader or travelling purchaser collects the agricultural produce and passes the same to his *mahajan*. Ordinarily he keeps a margin of one to two annas per rupee after paying off all expenses. But when he finds the cultivator in his clutches, by means of any advance or on account of the dire need for cash on the part of the cultivator, he manages to keep a margin as high as four to five annas per rupee. When the trader disposes of his goods through an *aratdar* or commission agent, he has to pay about one anna per rupee of gross sale-proceeds and actual expenses but no godown hire. In the case of the shop-keeper, the margin is moderate. Very often he acts on behalf of his *mahajan*.

The subsequent transactions seldom leave a margin of more than one anna a rupee for each intermediary, the usual net margin being six pies to one anna per rupee.

Method of financing each transaction.—As to this, the Marwari *mahajans* get their money from their Calcutta firms or their bankers at 6 to 9 per cent per annum. They again charge 12 to 15 per cent to the smaller *mahajan* who takes a rate of interest varying between 18 to 30 per cent when he deals with the local traders. This is for trading purpose when the money is advanced for short terms only. When money is lent to actual cultivators the rate is anywhere between 24 to 60 per cent. But when advanced against crop, no interest is apparently charged but a margin of 18 to 30 per cent is secured in the shape of lower price or increased weight.

Sometimes the *mahajan* advances money to the local trader to make purchases on his behalf. In such cases either the goods are taken at a price previously agreed upon or only a commission is allowed.

Except in the case of trade with the hill people in the out of the way places, there is no barter to any appreciable extent.

(c) *Steps for improving quality, purity, etc., of agricultural produce:*—

Unfortunately nothing or very little can be done under the existing conditions of local trade. First and foremost, the traders are not prepared to take account of many grades and qualities of commodities and they seldom encourage any producer by premium for articles of quality. Secondly, production is on so small a scale that, in collecting and practical handling of bulky products of low value, it is not an easy matter to respect the various grades. Thirdly, the people also do not appear to appreciate any small benefit that might accrue from putting their articles properly graded. Want of due consideration at the hands of the traders is perhaps primarily responsible for this attitude on the part of the producer.

Thus all these causes work in a vicious circle and have produced the present depressed condition in the quality, purity and grade of agricultural produce.

This state of affairs can be remedied only by proper organisation among (*a*) the producers, (*b*) the traders, and (*c*) the consumers.

To organise the producers is out of the question for all practical purposes for the present. The traders, i.e., the local traders who collect the produce, could do a good deal if they wanted but as they trade on mostly with false weights and false representations, there is keen jealousy amongst the members of this class and they cannot combine.

The only remedy that deserves to be considered lies in the hands of the consumers. Amongst them the small local consumers are not of much importance and they naturally do what they can to patronise quality and grade.

To my mind the big consumers, such as mills and factories as well as the export traders and brokers, could and should organise and fix standard qualities and premiums for superior grades. But all these would be done outside this Province as the ultimate market is in Calcutta. So practically there is not much for us to do; perhaps we could carry on some propaganda work in bringing the value of grading and selection home to the cultivators. The lantern slides may be requisitioned to help us in this matter.

Steps should be taken to place commercial intelligence at the disposal of the cultivators.

A good deal of benefit might accrue to the producers if reliable market quotation of jute, lac, potato, oil-seed, cotton, paddy, etc., could be brought to the reach of the cultivators at least in important centres. This would at least give a moral support to the actual producers. The publication of regular bulletins of commercial intelligence likely to be of importance of the cultivator requires to be considered.

QUESTION 21.—TARIFFS AND SEA FREIGHTS.—This Province is not directly much concerned with the tariffs and sea freights as our produce goes to the Calcutta market first. Generally speaking, higher tariff duties, and sea freights mean disadvantages for the cultivator as he has got to pay more for his purchases and gets less for his produce.

The question of abolishing duties for salt for feeding cattle after making it unfit for human consumption may be considered as such a measure is likely to have far-reaching effects on the problem of feeding cattle and their health.

QUESTION 22.—CO-OPERATION.—(*a*) The following steps would be useful in encouraging the growth of the co-operation movement:—

(1) By Government—
  (*i*) Lending money at cheap interest on a large scale either from their surplus of savings or by borrowing from outside.
  (*ii*) By providing adequate staff for supervision of organisation and inspection.

(2) By non-official agencies—
  (*i*) By coming forward to take up the responsibility of organisation and management as well by exerting their influence to induce people to deposit their surplus cash with the co-operative banks and societies.
  (*ii*) By inculcating the real spirit of co-operation amongst the people.

(*b*) (*i*) *Credit societies.*—To fully justify their existence, the co-operative credit societies should be in a position to take over the entire indebtedness of the members who are not beyond redemption. At present the resources of co-operative credit societies are ordinarily far too inadequate for this purpose. Another drawback is that very often people came to form a co-operative society without properly understanding the principles.

(*ii*) & (*iii*) Purchase and sale societies have got great disadvantages in the fact that qualified men with necessary business ability are rarely to be had and it is almost impossible for the amateur to compete with the professional traders who very often do not have scruples to adopt even unfair means.

(*iv*) Generally speaking, the education and mentality of the people are not suited to undertake co-operative association for digging wells, construction of *bunds*, walls and fences or planting of hedges. But the reserve funds of co-operative societies may be utilised for these purposes.

(*v*) As far as I can see, I do not see the slightest chance of successfully working co-operative societies for the purpose of aggregation of fragmented holdings and their redistribution in plots of reasonable size.

(*vi*) Societies for the co-operative use of agricultural machinery may be useful and successfully worked, but before any such undertaking is launched the efficiency of such machinery will have to be properly tested and demonstrated.

(*vii*) & (*viii*) Co-operative societies for joint farming and cattle-breeding are not likely to succeed at this stage of the movement.

(*c*) I do not think legislation will succeed in compelling unwilling people to co-operate.

(*d*) Co-operative credit societies have been of great help to the members where they are working properly but in some places they are in a moribund condition.

QUESTION 23.—GENERAL EDUCATION.—(*a*) The present system of general education appears to more or less alienate the educated people from agricultural pursuits. This has already had considerable effect on the rural population. For the prosperity of the rural population, it is highly desirable that agricultural education should be combined with rural education by providing suitable courses in the middle school. The pupils in the elementary school would be too young for taking up any agricultural course while those in the higher classes in the high school will be too much removed from rural environment to find it agreeable.

(*b*) (*i*) For this purpose practical as well as theoretical courses should be introduced in the middle schools established in rural areas.

(*ii*) & (*iii*) Primary education is not yet compulsory in Assam. It will affect people harshly if it is made compulsory.

As soon as a boy is big enough to be of use to his guardian, his services are utilised in cultivation and household work and consequently he has to leave the school.

QUESTION 24.—ATTRACTING CAPITAL.—(*a*) Under the present system of agriculture, cultivation does not pay well if the landowner is not himself a tiller. Consequently there is practically no room for the middle-class men to take up cultivation and it pays them better to get their land cultivated by share system. Moreover, the small size of the holdings makes it impossible to take up farming on sound economic lines. But in order to remove unemployment and discontent amongst the educated middle-class people as well as in the interests of more intensive production with the application of labour-saving devices and improved methods and manuring, farming on a large scale should be encouraged by all means. The following measures may be considered in this connection:—

(1) Leasing out waste lands on favourable terms.
(2) Steps for aggregation of fragmented holdings.
(3) Issuing land improvement loans on liberal scale.
(4) Supplying costly machinery on hire-purchase system.
(5) Carrying on experiments on the relative value of commercial crops of different kinds and also on methods of cultivation. This could be better done through model farms.

(*b*) When the landowner does not himself cultivate the land but leases it out there is not much incentive to improve his land; again when a cultivator does not own the land he cultivates, he is not interested in its improvement. So is the case when the land is heavily mortgaged.

QUESTION 25.—WELFARE OF RURAL POPULATION.—(*a*) Truly speaking, those who hold office under the Government and live in towns or visit the villages only occasionally can scarcely know the actual economic and sanitary condition of the villages. There should be some suitable local organisation to work as intermediary between the Government Department of Sanitation, Co-operative Societies, Agriculture and Industries and the people. I should think the village authorities should be extended and so modified as to take up all this work actively and qualified officers should be appointed to advise them in their working.

(*b*) It is highly desirable to carry on intensive surveys of typical villages and obtain sufficient information on all important matters regarding rural well-being and prosperity so as to enable the authorities to find

out the relative value of the various factors of improvement in the rural economy as well as to discriminately estimate the value and importance of the various problems connected therewith.

The scope of the inquiry should include the following:—

(*i*) Material and pecuniary resources of the cultivator.

(*ii*) How to improve the above.

(*iii*) Household expenditure and other charges which the cultivator has to meet.

(*iv*) Facilities for education, sanitation, etc.

(*v*) Incidence of the following on the general well-being and prosperity of the rural population:—

(1) Loss through sickness and bad health of the people.

(2) Loss through cattle disease, insect pests, scarcity of rainfall, heavy rains and floods, damages by wild animals, etc.

(3) Loss through want of good market facilities, usurious interest and want of banking facilities.

(4) Margin for increased income due to—

(A) Better marketing facilities, cheap finance, etc.

(B) Agricultural improvements consisting of—

(*i*) Cattle improvement.

(*ii*) Improvement in implements and cultivation.

(*iii*) Improved seed.

(*iv*) Improved rotation and manuring.

(*v*) Use of labour-saving devices.

(*vi*) Better care of crops and supervision.

(*c*) Recently an inquiry was made into the economic condition of a village in the Sibsagar district for which purpose an officer with several years of experience as an Agricultural Inspector had been deputed to work under the direction of the then Deputy Director of Agriculture.

The inquiry was not exactly on the lines I suggest above; however, it was sufficiently wide to give a thorough insight into the economic condition of the village. The broad conclusions from the inquiry so made would be as follows:—

The main handicaps to economic progress are—

(1) Illiteracy and mental inertia prevailing amongst the cultivators which make it difficult for them to imbibe new ideas.

(2) Want of facilities for proper education to achieve higher standard of living and high ideals of life before them.

(3) Want of incentive to keen competition for sharpening the intelligence.

(4) Fragmented and scattered holdings.

(5) Lack of facilities for subsidiary occupations and industries.

(6) Poor cattle and draught animals.

(7) Indebtedness and usurious interest and lack of finance.

(8) General alienation of ownership of land from the actual tillers of the soil into the hands of moneylenders and non-cultivating classes.

Supplementary Note on Irrigation.

The paddy growers, who form the bulk of the cultivators in Assam, grow only paddy, in some places only one crop and in others two crops. Excess of water and water-logging in the rains and want of soil moisture in the winter work as the limiting or controlling factor in introducing a rotation of crops and growing cold weather or spring crops. When we shall be able to think of irrigation and drainage of the paddy fields we shall also be able to improve the standard of cultivation of the paddy growers.

At present cultivation of *rabi* crops scarcely pays except on alluvial tracts near the river banks or on special tracts, where soil is fertile and sowing can be done rather early without fear of destruction by late rains. On many occasions the crop would not pay the cost of fencing and harvesting.

Thus drainage and irrigation of paddy lands with the object of increasing the yield of paddy by eliminating the factor of drought and introducing other crops on paddy lands, and also irrigation for *rabi* crops, appear to be great problems for agricultural development in Assam.

The following special problems may be taken up in this connection:—

(1) Survey of marshy places for reclamation by drainage.

(2) Survey for improvement in the *Dong*, i.e., local canals for irrigation in the northern part of Kamrup, Mangaldoi, and Goalpara.

(3) Survey of the Bhogdoi Valley for a large perennial irrigation scheme.

Irrigation for boro, i.e., spring rice.—In the lower tracts of Sylhet district, the spring rice is the main staple crop of which there are about 191,300 acres. *Boro* could not be grown without irrigation at least for a part of its growing period and the irrigation necessary is at present done by crude methods. Power irrigation would be of great help in various ways. The improvement of irrigation for spring rice is an important problem.

Oral Evidence.

25425. *The Chairman:* Srijut Laksheswar Barthakur, your appointment is that of Deputy Director of Agriculture?—Yes.

25426. You have given the Commission an interesting note of the evidence which you wish to give. Have you anything which you desire to say in amplification of that note, or shall I proceed to ask you one or two questions?—You may ask me questions.

25427. Would you give the Commission, very shortly, the story of your own training and past experience?—I was trained in agriculture in Japan. I was there for four years, from 1905 to 1909. After coming back to India I tried to start a sugar factory, and started a small sugar plantation, but I could not get sufficient capital, and I had to give it up. Then I was taken into the department as a Superintendent by Mr. McSwiney who had visited my farm and was pleased with the work. I served in the Surma Valley for three years ; I was then transferred to the Assam Valley, and after working there for some time I was allowed to act as Deputy Director of Agriculture, when Mr. Birt went on leave. After working for sometime again as Superintendent, I again got the chance of officiating as Deputy Director. Then I was once provisionally appointed Deputy Director, and my appointment was recommended by the Government of Assam as well as by the Government of India to the Secretary of State, but the Secretary of State did not accept that recommendation and I had to revert. After that I was working as Superintendent, and recently when the permanent Deputy Director Mr. Chakravarty went on long leave an account of bad health, I was put in charge of the duties of Deputy Director since September 10th last. During this period of eleven years of my service, I had the opportunity of working on some special deputations also. The first was an enquiry with regard to the disposal of the sugarcane grown in the Kamrup sugarcane farm. Again, the year before last, I was put on a special enquiry on the condition of cattle in Assam, and after the completion of the enquiry I submitted a report.

25428. Turning to the printed note of your evidence, you emphasise the importance of a survey of the local and provincial problems, and you say that that should precede the settling of a definite policy?—Yes.

25429. Is it your suggestion that no such survey was ever made before the present policy was recommended?—To my mind, it appears that no complete survey was made.

25430. It is not too late to remedy what you regard as an omission; how would you suggest going about these surveys?—By making a statement, I think I shall be able to indicate what I mean. When this scheme of the Agricultural Department was started by Mr. McSwiney, it was proposed that there should be one Inspector for every subdivision in the Surma Valley, whereas only one Inspector for every district was proposed for Assam Valley. This was done in a haphazard fashion as has been found out later on. To my mind, we should first have considered very carefully the requirements of each subdivision and the problems of each locality, and then gone on to postulate our recommendations with regard to staff. Just at present, the expert staff in the Agricultural Department are thinking a lot about doing good to the cultivator by their scientific methods. But when we go to the ordinary ryot with our ideas, he is actually quite innocent of any knowledge of what scientific agriculture is, and he is not in a position to receive all the benefits of scientific agriculture. Take manure, for instance. Just at present, if we recommend artificial manure, the ordinary cultivator is not in a position to utilise it, and that is the reason why we have failed in making bonemeal popular with the cultivators in the plains. In this way, in other spheres also we must first realise the nature of the problem and then go on to solve it. Take the problem of sugarcane, as another instance. Experiment on sugarcane was the first agricultural research started in the Assam Valley; to my mind sugarcane is not even the second, nor the third, nor the fourth subject which should have drawn the attention of the Agricultural Department here. We spent more than Rs. 6 lakhs in work on sugarcane on the Kamrup farm. We have also been working at Jorhat for the last twenty years for the improvement of sugarcane cultivation, spending Rs. 10,000 a year. In my opinion, sugarcane takes fifth or sixth place in importance in the agricultural produce of Assam. We gave out some superior sugarcane varieties but the cultivators are unable to utilise them properly, on account of the loss due to damage caused by jackals.

25431. You do not feel that the cultivator is getting his money's worth?—That is so. The money spent on sugarcane research has not been repaid in the shape of improvement in the ryot's cultivation. In this way, there are lots of problems which might be worked at but difficult to be solved, but to my mind all those problems should be arrayed and studied by some practical man, we should consult popular needs and popular requirements and the real needs of the cultivator, and then we ought to find out which problem we should tackle first. We had an Agricultural Chemist who worked for a long time; that post was suspended as soon as Mr. Meggitt retired, and Dr. Mitra, the Economic Botanist, was taken in. Now, there is talk of having a Mycologist and an Entomologist, and, it may be, other officers. But we have to decide before taking any step whether they will meet our real requirements.

25432. How do you divide the responsibility between the Director and yourself in the matter of deciding which problems shall be attacked?—After we have got a list of the problems, we should consult not only the Director but the public also. Generally speaking, the Deputy Director would take the initiative.

25433. Under present conditions, who decides which problem shall receive attention, the Director or you yourself?—In fact, as we have got a regular settled programme, the question of deciding which problem to take up does not arise at all; we have got the programme and the machinery to work and we are working.

25434. On the question of fragmentation of holdings, you say, "This is an All-India problem and a problem mainly for the Legislature." Do you mean that you are waiting for the hint from somewhere else in India as to how to solve this problem?—No: what I mean is that it is a common problem all over and we need not think it so important just at present as we have lots of waste lands for expansion.

25435. If there were legislation, would it not have to be legislation by the Provincial Government?—Yes.

25436. On the question of irrigation, do you feel that there is an opening for minor irrigation schemes in the Province?—Yes, I do.

25437. How do you suggest that Government could assist the carrying out of minor irrigation schemes?—I think what we require is to demonstrate the use of power irrigation. If we could introduce power irrigation, perhaps we could put more areas of higher level under *boro* paddy, thereby making them free from damage by floods.

25438. In answer to the question on Fertilisers you refer to the "enormous cattle manure and compost manure wealth of the Province, 80 per cent of which now is unconsciously thrown away". What do you mean by "compost manure wealth"?—What I mean is this that the cattle dung and household refuse should be stored under a shed, and properly utilised at the time when it is required for manuring our garden crops.

25439. In answer to Question 14, where you are talking about agricultural implements, you point out that improved implements will necessitate improved animals because of the extra traction power required. Have you any suggestions to make for the improvement of draught animals in the Province?—As I have already said, a special inquiry was made and a special report has been submitted in which I have discussed the whole problem of cattle improvement in the Assam Province. It is hoped that by the various means suggested therein we will be able to get a better class of draught animal.

25440. Is it the case that very few of the draught animals used in the plains are bred in the plains? Where are they bred?—Along the Brahmaputra there are lots of grazing places and there are a large number of professional graziers. They keep cattle and produce draught bullocks and draught buffaloes. Then, again, a large number of bullocks are imported every year from Bihar.

25441. What tracts of forest do the graziers frequent?—Forests are not frequented by graziers. There are special professional graziers' reserves. Besides, there are large areas of grass and reeds on the Brahmaputra banks where graziers usually keep their cattle.

25442. Have you any suggestions other than those set down here for the improvement of the draught animals? Is it a question of an improved beast or a question of improved fodder-supply?—Both.

25443. Do the cultivators rely more upon the cow-buffaloes for milk than upon the ordinary cows?—In the village, ordinary cows play an important part, but with professional graziers or *gowalas*, buffaloes are very popular.

25444. Is there a tendency on the part of the cultivators to neglect the cows and not to feed them sufficiently?—Their common practice is to leave the cattle to pick up what they can.

25445. You cannot have good bulls if your cows are not properly nourished?—Quite so. The main trouble lies with the general system as well as with the standard of cultivation. Paddy cultivation does not require highly improved cattle because the cultivation is done at the time of the rains. About 25 to 30 per cent improvement in the cattle will be quite sufficient to meet the paddy cultivator's requirements and for that I do not think high class cattle are necessary.

25446. Under the heading Animal Husbandry, you say that the obvious conclusion to which the fact that the cows in Assam are so bad leads you is that the climate is ill-adapted for cows but better adapted for buffaloes?—It has got to be properly investigated.

25447. You are satisfied that that is the case?—I think so.

25448. You do not think that it is due to better feeding of cow-buffaloes?—There is no special feeding for the cow-buffaloes. The same sort of treatment is meted out to both the cow-buffaloes and the cows.

25449. Why does not this Province suit cows?—I think the rainy season is very wet and the moist heat is prejudicial to the cow. During the cold weather also, we get about two months when the ordinary grass fodder becomes more or less scarce. The people are leisure-loving and

do not take particular care of their cattle; they are not so industrious as to produce artificial fodder for their cattle; thus the cattle are not properly fed.

25450. Do you think that buffaloes also come off as badly as the cows?—Yes; but buffaloes have got some natural advantages. They can graze on marshy places, where plenty of good fodder for them is available in the dry cold season also. Again they can feed on coarser herbage. That makes all the difference.

25451. No doubt they are better adapted by nature to deal with that particular environment but at the same time if the cow is provided with sufficient fodder in the season of shortage she would probably be able to withstand the climate, would she not?—Yes, quite so.

25452. When you are considering the problem of the Veterinary Service in the Province, why do you suggest that that Service should be under the Director of Agriculture?—The welfare of the cattle and the progress of agriculture are very closely connected with each other; so I think it will be better if the practical side of the Veterinary Department is in close touch with the Agricultural Department. What I mean to say is, that the higher research work and the scientific portion may remain separated but the actual treatment of village cattle should be under the Agricultural Department.

25453. What do you think of the herd of cattle at the Shillong farm?—The trouble is that we do not know the pedigree of the bulls and there is no pure breed from which we can breed them.

25454. And yet the herd has been in existence since 1896?—Yes. The policy has been changed from time to time. Just in the beginning, I understand, they started with cattle from Bhutan, which are almost like English cattle in appearance. They found that they did not suit this Province as they were not good milkers and the stock was mixed and no fixed type could be developed. Then it was thought that the Taylor breed from Patna would do better here and they were imported. Then we had also some of the Montgomery strain introduced. In this way we have been roaming about with the result that there has been no definite pedigree established.

25455. On page 53 in your answer to Question 16, you say that in Assam people keep many more cattle than they can properly look after and you propose that this practice should be discouraged by active measures. What do you mean when you say, "this practice should be discouraged by active measures"?—The cattle are let loose for the greater part of the year; that goes against the interests of improved cultivation. If we could restrict them from that point of view and if we tried to make them keep their cattle under guarded condition, throughout the year, then I think the number of cattle would be restricted and both the quality and the value of the cattle would be improved.

25456. In answer to Question 17, sub-sections (*b*) and (*c*), you say, "Subsidiary industries may be of two kinds, one contributing to the comfort or improvement of the standard of living of the cultivator and the other yielding him cash return." I do not see why you suggest that the first category, that is the one contributing to the comfort of the cultivator, should require no special training?—What I mean to convey is this, that there are certain articles which can be manufactured without much skill for domestic use as for example, mats and common wicker work. But there are certain other articles of commercial importance which will require high technical skill, and for these articles we will require special training. But for the ordinary articles of domestic use no special training will be necessary; that is what I mean.

25457. Is weaving on the loom popular in the Province?—It is quite popular in the Assam Valley; there it is an industry which is to be found in almost every household.

25458. What is the thread used?—So far as cotton weaving is concerned, they purchase the yarn.

25459. Where is it obtained from?—The coarse texture is obtained from Indian mills and the finer is imported from abroad.

25460. Is the produce of these looms used in the home or sold in the market?—Generally, it is used in the home, but there are some people who make it a point to earn their living by means of the loom and they produce finer things which are marketed.

25461. Do you find the looms used in the hills?—They do use a kind of loom in the hills but it is rather crude and they produce only rough cloth.

25462. Is not that a direction in which an industry that contributes to the comfort of the home might be deserving of a certain amount of propaganda?—Yes; and that is being done by the Industries Department.

25463. On page 55 you say, "Only industries connected directly with the preparation of raw materials to bring them to the marketable condition may flourish in rural areas; otherwise, generally speaking, local conditions in rural areas in Assam would not be suitable to the development of industrial concerns. It would perhaps not be desirable to industrialise rural areas, which will greatly disturb the village life and bring in undesirable effects." What exactly are you thinking of when you say that?—For industries we require a special kind of labour. Our villages are scattered and are not thickly populated and I do not think we will get a real industrial population there. For instance, we cannot encourage weaving and spinning as factory industries in the villages. But things like the ginning of cotton and the baling of jute might be encouraged in certain localities with advantage.

25464. What are the undesirable effects that you are talking about?—Agricultural life is somewhat different from industrial life. In industrial life generally, we have got to concentrate labour and we have got to house a larger number of people in a small area and in that way the sanitation is affected. The mentality of the people may be changed. Along with mills and factories the habit of drinking country liquor and other bad habits have come into existence to an extent which is not found among the agricultural population.

25465. You find the rural population ready to take up these spare-time occupations with a view to increasing their means a little?—They have got to; otherwise cultivation will not give them a good living.

25466. Would you turn to the chart on page 57 which you prepared to show the channels of marketing. What produce do you refer to?—The ordinary agricultural produce, oil-seeds, for instance. It applies to oil-seeds mainly; that is the only important agricultural produce.

25467. I just want to understand the chart. If you take the left half, the small cultivator, he may either sell to a local *hat*, or to the local shop or to the local trader. Then if he sells to the local shop, I take it that is the last link between himself, i.e., the producer, and the consumer, is it not? The local shop deals only with the consumer direct?—Yes; it deals with the consumer, but a part of the commodity is sent out to the *mahajan* and to the bigger merchant.

25468. From the shop?—Yes.

25469. That is what I wanted; so that the local shop acts in that case as a merchant?—Yes.

25470. It buys outright and then sells to the local *mahajan*, is that right?—Yes.

25471. Now, is that a matter of the local shop selling the surplus produce that it cannot dispose of by retail sale, or is it a regular business on the part of the local shopkeepers?—I cannot follow.

25472. The local shop is mainly concerned with its retail trade, is it not?—Yes.

25473. It may be that the local shop buys rather too much of one kind of produce and has a surplus and it gets rid of that surplus by selling it to the local *mahajan*; is that right?—Quite so.

25474. Now I want to know whether the local shop deliberately buys the produce with a view to selling it to the local *mahajan*?—Yes.

25475. I do not quite understand how these lines are drawn in the way they are. The local shop sells in the ordinary way direct to the local *mahajan*; is that right?—Yes.

25476. Then you see the line goes up from the local *mahajan* and goes round to *aratdar*. Does the local shop sell through the commission agent, the *aratdar*?—If it is not directly connected with the local *mahajan*, it sells through the *aratdar*.

25477. And it might sell to the big *mahajan* direct through the *aratdar*; is that the idea?—Yes.

25478. Now would you mind telling me, with regard to your answer to Question 20 (*b*) on page 56, how you arrived at these estimates of the margins on which the various intermediaries operate?—From my actual experience.

25479. Your own experience?—Yes.

25480. You give us some interesting figures about grading. Let us take two kinds of produce, first oranges. Where are oranges packed for the Calcutta market?—We have got two localities, one, the southern portion of the Khasi Hills on the Sylhet border; there are lots of orange gardens there; the oranges are taken by manual labour to the plains; from there they are taken by small boats to Chhatak, and from there they are taken by big boats down to Calcutta. All along they are kept in loose condition; there is no packing right down to Calcutta. Special platforms are made of bamboos in the boats and the oranges are placed about one foot in thickness and in this condition they are taken to Calcutta; that is one system. Then, with regard to oranges grown in the Sylhet plains, they take them down to the railway station; at the railway station they are put in baskets and taken to Chittagong; from Chittagong part of the oranges go to Burma and the rest are locally consumed.

25481. Consumed in Calcutta?—Of the quantity which goes down to Chittagong, part go to Burma and the rest are consumed there locally. Here in the Assam Valley we have oranges, some near Gauhati and some in the Mangaldoi sub-division; they also are taken down to the railway stations, very often in carts in loose condition; at the railway station they are put in bamboo baskets and then sent to Calcutta.

25482. Are they of mixed quality or of even quality, speaking broadly?—They are of mixed quality. They are generally of two or three grades according to the size; but still they are on the whole of a mixed quality.

25483. Do you happen to know whether there is an export trade in oranges?—Out of India?

25484. Yes?—I do not think so, except to Rangoon; because Calcutta is a big market and the fruits which are produced in this place can be consumed in the Calcutta market.

25485. *Prof. Gangulee:* And they are graded up there when they reach Calcutta?—They may do a bit of grading there; but in these localities we have two or three grades only, not more than that.

25486. Do you think the price of oranges in Calcutta bears the cost of grading and packing?—I do not think proper packing will pay just at present.

25487. Where are potatoes packed if they are packed at all?—Here in Shillong they are put in bags and taken to Gauhati and transported.

25488. And not packed again?—They are packed in bags.

25489. They are not re-packed?—No.

25490. How do they grade?—They do not grade; but the cultivators themselves have three grades generally, one big size for the Calcutta market, one medium size which is used for the ordinary market and the other small size.

25491. Is that grading effected by hand-picking?—Yes, hand-picking.

25492. *The Chairman:* Further, in answer to Question 22 on page 60, you are very despondent, I notice, about the success of any attempt to consolidate fragmented holdings on a co-operative basis. Are you aware of the successful efforts that have been made in other parts of India in that direction?—No; I have not read much literature on this subject, but I know the mentality of the people here; their educational attainments and their local conditions make me despondent.

25493. Then you say that you think it would be a good thing to inculcate the real spirit of co-operation amongst the people. Is any attempt being made to inculcate the real co-operative spirit?—Our Co-operative Inspectors and Agricultural Inspectors are *doing something in* that direction, but they are over-burdened *with their ordinary routine* work; so they have very little time to spend *on real propaganda work.*

25494. I see in the next paragraph you say that co-operative credit societies should be in a position to take over the entire indebtedness of

their members, or of such of them whose affairs are not beyond redemption. Do you suggest that credit societies as at present constituted and financed should undertake that class of work?—No; there is not enough capital for that purpose.

25495. In answer to Question 25 (*b*) on page 61, you give us a list of headings which might, in your view, form the basis of a detailed survey of a village. Would you be inclined to include an accurate statement of the size of a holding with the details of fragmentation? Would that be helpful?—Yes.

25496. And also statistics of debt?—Quite so.

25497. Do you find the incidence of debt very heavy on the cultivators in the plains?—I do not think the incidence of the debt is heavy, but the interest is so high that it stands in the way of further progress.

25498. Have you ever known of a case of a cultivator who was seriously in debt being able to clear it off by his own efforts?—Generally, what they do is, they sell off part of their property and begin again.

25499. You have known of no case of a cultivator having any margin of income, over and above what is required for his family and himself to live upon, which might be available for wiping out his debt; have you or have you not?—There are very few instances of their keeping their property intact and at the same time extricating themselves from debt by means of agricultural income. They generally part with part of their property and then start again. There are lots of land in Assam and there are lots of new openings in trade and commerce. If a man is resourceful he can begin a new life and get on well.

25500. *Sir Thomas Middleton:* You have been to Japan, I think?—Yes.

25501. Did you study there in an institution?—Yes.

25502. For how many years?—I was in the college for three years.

25503. Afterwards?—Afterwards I was working in a sugar factory.

25504. You were studying in a college of agriculture?—Yes.

25505. Can you answer this question? Your best rice crop in Assam is Spring rice, and you get about 1,000 lbs. an acre. In Japan the average produce is about 2,800 lbs. How do they manage to do it? It is nearly three times as big an yield as you have got under your best conditions?—In Japan, the holdings are very small and they do very intensive cultivation; so the conditions are different.

25506. Your holdings are also very small?—They are much smaller there and the Japanese cultivator's life is an economical life. He has no land lying waste; in his fields there is no room for weeds to grow; he takes crop after crop; for him the soil is his only lavatory; he supplies as much irrigation as is necessary and he gets the maximum possible crop; he also puts in good and sufficient manures.

25507. Then do you attribute the large crop mainly to the manure?—Manure and regular water-supply.

25508. We understand that in Assam you have got as much water as you want?—Not necessarily; even in Assam there is a lot of land which cannot be placed under good cultivation for want of water. The rain falls and the water goes away; it is not properly conserved. There may be water 9 inches or 1 foot below the surface or in a drain close by the paddy field, but it will be of no avail.

25509. Did you form the impression that they have more productive varieties of rice in Japan?—I do not think so; it is due to the manure and the condition of the soil.

25510. Careful cultivation?—Yes; careful cultivation.

25511. You have given us a list of problems on pages 46 and 47 of your replies. You suggest investigating the value of tillering as against heavy ears of rice. Was that a suggestion that you have got from Japan?—No; that is my own experience, my personal observation. In each head of paddy we find 250 to 500 grains, and then again from one seed we can expect to get three heads of mother plants, not to speak of the tillers. So it comes to about 800 to 2,000 times. When it is so prolific we need not bother about tillering. In my experience, I have seen that if we have a large number of

tillers they rob the mother plants of a good deal of nutrition and weaken them; at the same time in the cooler part of Assam when the cold weather sets in there is shortage of water and warmth and the tillers do not develop properly.

25512. So your conclusion is that you should work for big heads rather than tillers?—That is my confirmed conviction.

25513. That same conclusion has recently been come to by one of our British experts in the case of wheat?—It might be.

25514. Your next point is the study of the flora of the rice field. Do you mean weed flora?—Yes.

25515. What weeds were you thinking of?—I am not quite sure; but I have observed different kinds of weeds on different kinds of soil and I think an indication of the weed flora will be very helpful to the cultivator or the practical agriculturist in prescribing the manure and devising methods to kill them.

25516. Is that also your own idea or is it a suggestion which you have got from Japan?—That is my own idea.

25517. Water-hyacinth has been mentioned as one of your pests in Assam?—Yes, especially in the Surma Valley.

25518. Why is the manure made from hyacinth not appreciated by the cultivator?—It is not that they do not appreciate it, but it involves so much trouble.

25519. The manure is good but troublesome to prepare?—If they took the same trouble in other ways they could get better manures.

25520. More cheaply than from water-hyacinth?—I am not quite sure about that, but they could produce better manures in other ways.

25521. But if you were endeavouring to get rid of the water-hyacinth, would it not be necessary to find some use for it?—To my mind water-hyacinth is a blessing in a way.

25522. I think Bengal will supply you with as much as you want?—We ourselves have got the weed in some places; it is dangerous in the Surma Valley, but it will be a blessing in the Assam Valley where we have numerous small stagnant ponds; if this plant is put into these it will take up all the plant food from the water and thus purify it. We have got other water weeds which infect our ponds and trouble us very much. But if we put in water-hyacinth it will drive away all these.

25523. If you can make some use of the water-hyacinth then you get some benefit, not otherwise?—Of course; manure is the only use for it.

25524. Are you in charge of the potato work in the Province?—Yes.

25525. Is it important to secure early planting?—In the plains it is; but we cannot do it on account of the rains; there is the fear of late rains.

25526. What is the best time for planting, take first in the hills?—In the hills they are planted for the summer crop in the month of March; I am not closely connected with hill agriculture.

25527. For the plains what is the best time?—As soon as possible after the rains are over.

25528. That will be about what month?—October in the Assam Valley and November in the Surma Valley.

25529. Then you have had difficulties of the seed going rotten?—Quite so.

25530. What is the cause of the difficulty? Bad storage?—I think it is due to potato blight.

25531. Do you not think that in storing your seed potatoes in trays, you should not put so many in a single tray as you have done in Shillong farm?—It is true; but people want a very cheap material for planting; they are not prepared to pay a higher price.

25532. You cannot expect good results from potatoes stored in the way in which you store them here?—What you saw in the Upper Shillong farm is in much better condition than what we find in the case of the ordinary potato growers or dealers; they keep them two or three feet deep.

25533. The potato disease is a great trouble here?—Yes.

25534. Do you spray regularly on your experimental farms?—Yes, we do generally and also in the districts by way of demonstrations.

25535. How many times do you spray?—Usually two and sometimes three times.

25536. Do you find that quite effective?—It is effective.

25537. Is your practice followed to any extent by the cultivators?—Some of them follow it; but I do not think that many of them care to do it.

25538. What is the reason? Is it on account of the expense?—Firstly, their mentality is not yet prepared for any sort of improvement like that.

25539. Although their potatoes were in danger of being entirely destroyed, they would not spray to protect them?—The real reason is this: they prefer to depend upon chance. Sometimes when the disease is not severe they get a good crop; they would rather wait and see than take preventive measures. So if there is a severe attack of the disease, they suffer very badly.

25540. What do you call a good crop? How much?—Here in the hills 50 to 60 maunds per acre and in the plains 80 to 90 maunds will be considered a good crop.

25541. And the same if attacked by the disease would yield how much?—It would come down to at least half.

25542. You have written a special report on cattle. Has that report been printed?—Yes; it has been printed and published.

25543. Can you tell me whether any of these Bhutia cattle survive here?—There are very few Bhutia cattle in the plains and they are susceptible to rinderpest; of course there are no pure Bhutia cattle; but some indications of them are left in some of the cows in the Upper Shillong farm.

25544. You refer to experimental work in connection with green manures and you note that cowpea as a green manure was a failure?—Yes.

25545. In what respect has it failed?—It has failed as a green manure for sugarcane, as sugarcane cultivation is carried on by the ordinary cultivator on a small scale on small patches; and it is uneconomic to fence the cowpea crop which is very much relished by cattle.

25546. So it was not the fault of the cowpea; the cowpea was destroyed before it was used as green manure?—Yes; another point is that it has to be hoed in at a time when the cultivators cannot spare labour to deal with it because that is the important paddy transplanting time.

25547. You had success with bonemeal in the Khasi Hills but not in the plains?—Yes. In the plains although the results were not unsatisfactory, people did not take it up.

25548. How do you measure the success? Can you tell us what the increased crop in the hills was by the use of bonemeal?—I think one maund of bonemeal produces 1½ to 2½ maunds of increased paddy in the first year.

25549. That is in the first year; is it the same in the second year?—In the second year, it is a little less; altogether an average of perhaps two maunds in two years.

25550. Is bonemeal largely used by the cultivators?—In the Khasi Hills it is.

25551. On the question of fertilisers, you say that only 10 to 15 per cent of the cattle manure is utilised. Do you mean 10 to 15 per cent of the total bulk produced? Does your estimate include fertilising matter carried away by the rains?—The wastage includes the washing away by rains. Little of this is used by direct application.

25552. Do they not apply all the manure they have?—In paddy tracts the village washings do go to the paddy fields and indirectly those fields are manured. But my manurial matter may go not to my field but to some other field.

25553. We will get your views on cattle and cattle improvement from your report, and I shall not question you on that. You note that the price of milk and dairy produce has risen very much recently. Over what period of years is that? Since the War?—It was after the War. I think the increase is mainly due to the expansion of cultivation.

25554. Over what period has milk been increasing in price rapidly?—Within the last six years it has increased very much in Assam.

25555. And you attribute it to the increase in cultivation and the reduction in fodder; is that your explanation?—There is an increasing local demand. Moreover, the area available for grazing for the professional graziers has deteriorated in quality. The professional graziers came from Nepal not very many decades ago. They had a prosperous time up to 1919 or 1920, but by that time most of the suitable areas thrown open to them were eaten up.

25556. That means they kept far too many cattle for the land?—Yes; I have made that point clear in my report.

25557. *Dr. Hyder:* From the table that you have given of the number of days that the cultivator works in different tracts of the Assam Province, I find that the more prosperous the cultivator, the greater the number of days he works. Why is that? Is it not just the other way?—Those who work hard are better off.

25558. You say on page 54, "If we divide the cultivators into three classes according to the keenness of their struggle for existence and on account of diversities of natural advantages, we would probably get the following figures showing the days of labour on agriculture proper." And the figures you give are, "Cultivators of the well-to-do or nourishing class who depend entirely on agriculture, 300 days in the Hills. . . . Cultivators who live a precarious life and also work as labourers in spare time, 180 days in the hills." What is your explanation?—Those people who have got no subsidiary industries have to work harder in the fields than those who have subsidiary industries. Those who have subsidiary industries have a secondary income, and that helps to keep them in good condition.

25559. Then those people who do not have enough land or have no land?—In Assam the question of people having no land does not arise. People have only to go to the trouble of taking up cultivation, because only one-third of the area available for cultivation has been put under cultivation, the remaining two-thirds is still left uncultivated.

25560. The point I want to be clear in my mind is: if a man is not well-to-do and wants to improve his position, he can take up land and he will have to work a larger number of days; is that not so?—Yes.

25561. I think the table is upside-down in other parts of India; the more prosperous the cultivator the smaller the number of days he works. Here the more prosperous the cultivator the larger the number of days he works?—People who are purely agriculturists have to work a larger number of days (it may not be a larger number of hours) than those who have subsidiary occupations. In giving the number of days worked by people having subsidiary occupations, I have not taken into calculation the number of hours they spend on home industries.

25562. You have not included the hours they devote to cottage industries?—No. The heading is, "the days of labour on agriculture proper."

25563. What are the main currents of immigration to Assam?—From Mymensingh and some from Serajganj.

25564. That is more or less permanent colonisation?—Yes.

25565. What other currents?—Labourers are imported by the tea gardens. After working for a time in the tea gardens, they settle near about the gardens.

25566. That is also permanent?—Yes.

25567. There is very little temporary immigration?—Yes; there is very little temporary immigration except of cold weather coolies, *Nuhnias*, who come from Bihar for three months and go back.

25568. That is for Public Works Department work?—Mainly for work under the Public Works Department and the Local Boards.

25569. *Mr. Hezlett:* Do you not think that one of the main causes of the poverty of the Indian cultivator is the fact that he does not work for all the 365 days in the year as the ordinary farmer in most of the European countries? You give the number of days he works. Apparently no man works more than two-thirds of the year?—Where will they work and on what? The agricultural labourer cannot go away from his home. At least it does not suit him.

25570. He can grow garden crops in the winter?—Cold weather cultivation is very precarious. In spite of the 115 inches of rainfall, there is not enough moisture in the soil to grow any good crop in the cold weather which will pay his wages.

25571. You say it would not pay him to cultivate cold weather crops?—Yes. The standard of cultivation is so low.

25572. He only grows one crop in the year, taking it all round?—Yes.

25573. And his time is not fully occupied?—No.

25574. For instance, you take the people from Sylhet who grow the Spring rice, *boro* rice; they start cultivation about October as the water goes down; they prepare the ground and plant their rice, and they reap the rice in March or April. Then, from April to the end of September they do nothing at all?—They have to cut grass for their cattle; that is their main occupation in the slack season.

25575. Otherwise there is little occupation for them. They do a little fishing?—Yes.

25576. *Sir Thomas Middleton:* Do they cut grass for their cattle?—In the Surma Valley they do.

25577. They cannot work very hard, judging from the condition of the cattle as you describe them?—They have to keep their cattle indoors for months together; there is no place for them to move about. They have got to go sometimes five to ten miles to get grass and that takes a lot of time.

25578. *Mr. Hezlett:* After the Spring rice is reaped, the whole area goes under water; only the village-sites are above water?—Yes.

25579. So, they have got to support the cattle somehow: they even dive down to bring the grass up?—I have described that in a bulletin *Fodder Supply of the Surma Valley.*

25580. Then, as regards this new farm you are proposing to start at Khanapara, can you tell me why Government have decided to breed draught bullocks in preference to dual purpose animals?—That is under the advice of Mr. Henderson. My idea was different; I would have gone in for a larger farm on a wider scale and taken up the improvement of the local stock of cattle by selection also.

25581. Was one of the reasons due to the fact that the ordinary man wants bullocks to pull a cart? For instance, he has got to import bullocks from Bihar and Orissa or some other Province. We do not produce bullocks in this Province for cart purposes?—We do not produce the larger type of Bihari bullocks suitable for carts. Production of cart bullocks is not the main problem in Assam; we want plough bullocks for paddy cultivation.

25582. It is your theory that the ordinary Assamese cattle can be improved to make them sufficiently good for the demands of cultivation in the Province?—For paddy cultivation we want only 20 to 30 per cent of improvement. Costly pair of bullocks, say, bullocks worth Rs. 200 would be quite useless for the paddy cultivator.

25583. As regards administrative problems, I see you consider that the Superintendent of the veterinary staff should be under the Director of Agriculture?—Yes.

25584. Is it not sufficient that the two should be under one Minister? They are both under one Minister at present. Cannot the Minister co-ordinate the work of these departments sufficiently without having them directly under one executive officer?—From what I have seen of the working of the Ministers during the last two terms, I do not think that a Minister can take sufficient interest in the details of the working of the departments as a Joint Director would.

25585. With regard to the feeding of cattle in this Province, do you not think that we have too many grazing grounds? We have the village grazing grounds and the professional grazing grounds. Does not the mere fact that we have so many grazing grounds more or less prevent the cultivator from growing fodder crops? So long as his animals can pick up sufficient food to keep them alive by utilising these grazing grounds, he will not grow fodder crops?—I do not think the grazing grounds we have got are quite sufficient for the requirements.

25586. My point is that so long as we have these grazing grounds, and so long as the cultivators have something upon which their cattle can live somehow or other, they will not grow fodder crops?—In my report on the Assam cattle, I have noted on this problem. The average output of a pair of paddy plough bullocks is 12 *bighas* of land, that is a pair will cultivate only 4 acres of paddy land. There is work for this pair for four months in the year. The gross value of the produce will be Rs. 250 to Rs. 300, and there is no work for the bullocks for the remaining eight months of the year. The cultivator cannot afford to grow fodder for feeding such a pair of bullocks for the remaining eight months of the year. So, unless and until we can change the methods of cultivation of the paddy cultivator, we must provide for free grazing. That was the custom from time immemorial, and, unless and until we have entire economic changes in the method of cultivation, we cannot propose to do away with the village grazing concession.

25587. That is necessary?—Yes.

25588. Of course you agree, I think, that village grazing grounds are bad from many points of view; they spread epidemic diseases, they make selective breeding impossible, and they have many other disadvantages?—Yes, I agree. In my Report on Cattle, I have suggested that the people should be compelled to keep separate a small plot of land as their own grazing ground, and I have given it the name of *neej gochar*. My idea is that if we cannot make any economic change in the system of cultivation, we have got to determine the monetary value of the grazing concession according to the size of the area which we shall have to give to the cultivators. After determining that, we should give half of it as a grazing ground to the whole village, and half of it should be provided to the individual cultivator in his own holding. This can be shown in the settlement as *neej gochar* grazing land, for which a very low rate of revenue may be charged. Thereby, we will incidently compel the cultivator to keep a plot of land especially set apart for grazing purposes.

25589. *Sir Thomas Middleton:* Would he enclose that land?—He would, if necessary. My idea is that public grazing is no man's property, and it is not possible to improve it. Constant grazing without any manure leads to economic waste. If the cultivator has his own plot of grazing land he can fence it if necessary. He will in time be able to manure it and improve it, and that will be very useful for the improvement of his own cattle and other economic improvements. The sooner you begin this process the better, because every year the value of land is increasing and the problem is getting more and more difficult.

25590. *Mr. Hezlett:* In the written evidence of the Dewan of Gauripur, it is stated that some cultivators put a piece of land under grazing for some years and then transfer their cattle to another piece, putting the old piece of land under cultivation, and thus getting a rotation of grazing and cropping. Do you not think that something like that might be useful? The land may be kept under grazing for two or three years and then put under a crop?—The system mentioned by the Dewan of Gauripur is accompanied by temporarily putting up the cow-shed also which greatly helps conservation of cattle manure and improves the cultivation much beyond what we find elsewhere; but if we let a piece of land go fallow and leave it for a few years for grazing purposes, I do not think it will improve; it will deteriorate.

25591. For ordinary crops it will deteriorate?—Yes.

25592. The general experience is that if it is kept under grass for two or three years, you can grow better crops on it afterwards?—Yes, it is on account of the rest. But the system is not suited for improving cultivation. We have got to aim at a system which will gradually take us to intensive cultivation; with the increase of population, the pressure on land

and the increasing value of land, we have got to improve the system of cultivation and cannot afford to keep the land fallow for a long time; simply keeping it for the purpose of cattle grazing will not improve the land.

25593. I have read that the ordinary grass vegetation of Assam is deficient in some of the salts which are necessary for cattle, and that you can never hope to produce a good type of ox unless that deficiency is made up; do you know anything about that?—That is quite possible, but as yet we have had no experiments made on this line, and we are not in a position to say anything. While I was conducting my enquiries on the question of Assam cattle, I came across some localities where the cattle appeared to do exceptionally well; I found that the cattle on one side of a river were doing well, while those on the other side were very poor. I attribute that to the difference in the quality of the fodder, which may be due to the condition of the soil in the two areas. We have got to study this problem.

25594. I understand that you are in favour of developing the buffalo?—Quite so.

25595. Possibly, the buffalo may be a more suitable animal to develop than the ox?—Yes.

25596. *Sir James MacKenna:* I am rather curious to know when you went to Japan to study?—It was in the year 1905.

25597. Before we started serious agricultural training in India?—Yes; then there was a regular movement of young students going out of India for study; some went to Japan, some went to America, and some went to England; as I was poor and had not sufficient means to go to America, I took the first opportunity and went to Japan.

25598. What did you study?—Agriculture.

25599. Are you a native of Assam?—Yes; I belong to the Sibsagar district.

25600. Do you belong to the cultivating class?—No, I am a Brahmin, but it does not prevent me from studying these problems. I own some land, and I have to get it cultivated through hired labour, which is much more difficult than cultivating it with one's own hands.

25601. As Deputy Director, do you do any research work?—The Deputy Director here, under present conditions, has absolutely no time to think of research, not to speak of doing research; he has no time to read magazines or books. His office work, the accounts and other things, take up the whole of his time. Formerly we had two Deputy Directors; under the recommendations of the Retrenchment Committee one of them was taken away, but the work has increased three times. At present one man has to do six times the work that was done by Mr. Birt.

25602. I was wondering who did the research. You have a lot of Demonstrators, Superintendents and Inspectors; I want to know what research work is done to enable these officers to keep themselves employed?—Jute seed we got from Bengal. So also *Indrasail* and the *Kataktra* seeds; the *Georgesail* was produced by a gentleman of our district by chance; and the research station at Karimganj which was started some time ago has produced the *latisail* and some *aus* varieties. For sugarcane, we have done a lot of work at Jorhat.

25603. In the matter of agricultural education, you suggest that a number of middle schools might be converted into agricultural schools; have you considered the difficulty of getting suitable teachers for these schools?—We have got to get the teachers as we get the Inspectors; to start with only three or four schools will be necessary, and we will not require many teachers for them.

25604. How would you train them?—They will have to be taken from the agricultural colleges.

25605. But you have not got one?—We shall have to go to other Provinces.

25606. On the question of demonstration and propaganda, you refer to sugarcane varieties. I do not know which these are; are they improved canes?—We had striped Mauritius, B. 147 and B. 376, which have come out very well; they were being tried by the cultivators for a long time;

they are good canes so far as their plantation and sugar content are concerned, and they are suitable for plantation conditions. For the ordinary cultivator's requirements they are not quite suited on account of damages by jackals. The *tana* variety was once tried at Jorhat; it was found inferior and discarded; it was re-introduced from Bengal, and now it is being used on a large scale. J. 33a is a small thin cane; that was found to be very rich in sugar, and we tried to introduce it among the cultivators; it was quite hard and not susceptible to damage by jackals, but as the cane was thin, the cultivators did not like it because they want a dual purpose cane; sometimes they want to manufacture *gur* out of it, and sometimes they want to sell it for chewing purposes; so, it is not very popular. We are trying D.74 and Co.9; they are much more hopeful.

25607. Which variety suffers the least from the attacks of jackals?—All soft and superior canes are liable to attack by jackals.

25608. Have you any thick-skinned canes which resist attack by jackals?—D.74 is one we are trying; it is a thick cane, and it is likely to be popular with the cultivator. There are some other canes which we will be able to show you when you visit Jorhat.

25609. Have you any idea of the extent of the cattle traffic from Bihar? Have you got any figures?—I have no figures, but my own idea is that from Rs. 5 lakhs to Rs. 15 lakhs worth of cattle are being imported from Bihar; ordinarily it will be worth Rs. 10 lakhs to Rs. 12 lakhs; that is from Bihar side. From Bengal side we import some cattle into Surma Valley, but I have no idea as to the volume of the trade.

25610. You say that oil-cakes are being extensively used in growing sugarcane, fruits and vegetables; where is this oil-cake obtained from?—There are lots of oil mills in Assam.

25611. It is locally manufactured?—Yes.

25612. *Prof. Gangulee:* You have been the Deputy Director for a few months?—I had officiated for about four years in the past and have now been put in charge since September last.

25613. You have already mentioned the nature of your duties as a Deputy Director. You have four experimental farms here and you are in charge of these farms?—Yes.

25614. Who plans the experiments?—We prepare a cropping programme every year.

25615. I find from the list that you have a number of experiments and you have them in rotation. I was wondering who plans out these experiments and also what is the method of doing them?—A scheme was enunciated when the farms were established and we are still carrying on that scheme. According to that scheme we have got to prepare a cropping programme twice a year to suit the seasons. That programme is prepared by the Deputy Director and is passed on to the farm manager who sees that it is executed.

25616. Do you sit around a table and discuss the nature of experiments?—Yes, we do.

25617. In the case of Karimganj farm you have got a list of twelve experiments. I wonder who plans out these details?—My predecessor, the Deputy Director, did it.

25618. What experiments are going on now? You have got four farms; we will have them all one by one. Let us begin with the Upper Shillong farm?—Potato experiments are carried out there.

25619. Both varietal tests and immunisation from disease?—We are testing imported varieties of potatoes.

25620. So, at the Upper Shillong farm, you have varietal tests of different kinds of potatoes and also the experiments of immunisation from potato disease?—Yes. Besides, there is also the work on cattle-breeding.

25621. Now, let us come to Jorhat farm. What experiments are carried on there?—Sugarcane is the main thing there especially with reference to the superiority of yield of *gur*. Now, we are taking up the new varieties of sugarcane which are immune from jackals.

25622. At the Jorhat farm you are carrying on experiments with sugarcane. Are you also carrying on varietal tests?—Yes.

25623. What experiments are being carried on at the Karimganj farm?—There experiments are being carried on with rice.

25624. Who looks after hybridization?—That is the work of the Economic Botanist. The scientific portion of the work is under the Economic Botanist; the Deputy Director is responsible for the general work of the farm and he is also responsible for other experiments which are not controlled by the Economic Botanist. We also carry on manurial tests and field tests of different varieties.

25625. So, there again you are having varietal tests and manuring tests?—And also cultural experiments.

25626. Then what about the Titabar farm?—That is also a rice station. It has been in existence for about three years.

25627. Out of these four experimental farms, two farms are devoted to rice work. Are you in touch with any rice work done elsewhere in different parts of India?—I am not in touch with that work. Of course, I have seen some reports.

25628. You are not in touch with the breeding work done in the Madras Presidency and elsewhere?—No, I am not in touch with that.

25629. Do you know the nature of the work they are doing there?—I am not aware of it but Mr. Chakravarty might be aware of it.

25630. You are not aware of the paddy breeding work in the Madras Presidency even through literature?—I have seen some literature on the subject now and again.

25631. You know the nature of the work?—I cannot say that I have studied it very closely.

25632. Your Director told us that he was aware of some farms in this Province which are run by middle-class young men. Are you in touch with these people?—I am.

25633. Are they running these farms on economic lines?—It is still too early to say.

25634. What is the average area of these farms?—One farm is 300 acres.

25635. They are growing chiefly commercial crops?—Yes.

25636. Do you know whether these young men have been trained in agricultural colleges or are they just *bhadralog*?—There are one or two gentlemen who have had agricultural training.

25637. You are in touch with these people?—I am.

25638. With regard to seed distribution, you are aware of the activities of the co-operative societies in this work?—Yes.

25639. They are flourishing in that direction?—Yes; they are useful.

25640. Are you quite satisfied with them?—In the matter of seed distribution, we have got to consider different seeds separately. So far as the question of paddy seed is concerned, it is not sold at all. The cultivators would like to have a few seers of seeds and they themselves propagate them. But potatoes are being sold on a large scale.

25641. In the resolution of the Government of Assam I find this sentence which I will read out to you, "The distribution of seeds through co-operative societies fell off slightly, however. The result is due largely, in the opinion of the Director, to the want of interest shown by the officers of the department in the Surma and the Lower Assam Valleys." Could you explain to us to what situation the reference is made here?—In some places there was some trouble about the quality of seed potato in the previous year and its sale fell off slightly.

25642. Are you aware of the remarks made by the Government of Assam?—I am aware of them. But the fall was not very severe; it might have been partly due to different reasons.

25643. With regard to agricultural finance you say that the scope of the Agriculturists' Loans Act should be extended and adapted to the cultivators' needs. Have you any concrete suggestions to make?—Under the Agriculturists' Loans Act only small amounts are advanced which are not sufficient to help the indigent cultivators.

25644. With regard to the fertilisers, I was rather struck the other day at the Upper Shillong farm with the wastage of manure that is going on there. There is an amazing lot of wastage. Are you carrying on an experiment with regard to the preservation of farm manure?—We tried to popularise covered sheds because pits are not suitable in Assam as water gets in during the rains. In the Upper Shillong farm there are two sheds. One of them has been blown away and it has not been replaced. We are going to have a new manure shed soon.

25645. Are you aware of the Pusa investigations, with regard to this problem of preserving farm manure, which are being carried out by Mr. Joshi?—I am not aware of them.

25646. Is there any arrangement for testing seeds?—Yes; the Economic Botanist tests the seeds.

25647. Both with regard to purity and germination?—Germination is tested in the seed depôt also; we keep a record of it.

25648. Before you send out your seeds to the cultivator, are you aware of the percentage of germination?—Yes.

25649. You guarantee the percentage of germination?—We cannot guarantee always. We have often got to purchase our seeds in the market. Sometimes we get them from Bihar, especially the seeds of pulses.

25650. With regard to the cultivation of fodder, are you aware of the investigations done elsewhere? Do you know the Bangalore experiments?—I do not know the details. I have not studied them closely.

25651. With regard to your suggestion about a Cattle Trespass Act, how would the local bodies view your proposal?—They would resent it very much.

25652. You do not think the local bodies would view the proposal favourably?—I do not think they would welcome it. They want more money for their roads.

25653. You have pit silos in your Upper Shillong farm. Are you carrying on any experiments elsewhere?—We have just tried an above-ground bamboo silo in Jorhat farm. It has proved a success to some extent but the sun is too strong on the one side and the stuff becomes too dry. We are however carrying on with that experiment. I do not think the ordinary cultivator will take to silage making.

25654. Why not?—If they would preserve all the paddy straw, they could feed their cattle tolerably well, but even that they will not do; besides they have got other resources.

25655. They do not feel the necessity of silage?—The necessity is there but they do not care for the better standard of keeping cows.

25656. You realise the importance of silage?—Yes.

25657. In your new cattle farm which you propose to start at Gauhati, you propose to carry out some silage experiments?—We propose to grow our own fodder there and make silage out of that.

25658. With regard to the question of marketing, you have stated in your note that steps should be taken to place commercial intelligence at the disposal of cultivators. Have you any suggestions to make in that connection?—What I mean to say is that if the Calcutta market price for lac, jute and cotton is properly advertised, it will be of some use to the people.

25659. We understand that. What I want to know is the nature of the machinery that you would like to create to transmit the commercial intelligence to the farmer?—You know that some of the papers publish the prices; they may be made available to them. Besides, a special bulletin might be published under the ægis of Government.

25660. But the farmers are illiterate in this country?—It would be better to try it; as the people are interested in the prices they would try to obtain information for their own benefit, because the rise and fall of the market affects them very much.

25661. You say the co-operative credit societies in some districts are in a moribund condition; can you tell us why that is so?—Well, in most cases, their idea in forming a co-operative society is that they will pick up a few friends and form a society, get a loan from the Central Bank and distribute it amongst their friends. In this way when it is a matter

of a few friends or a few interested persons it becomes moribund. A lot of loans are made, very little of which is used for the right purpose.

25662. You mean that the co-operative societies are not based on co-operative principles?—They are based on co-operative principles, but the people who are carrying on the societies, the village people, are not yet sufficiently educated, or they have not yet imbibed the spirit which is necessary to preserve these organisations. I do not say this applies to all societies, it only applies to some societies.

25663. On the question of general education, I cannot understand your remark that primary education will have a harsh effect if it is made compulsory?—In the agricultural areas we find students flocking to the schools when there is no pressure of agricultural work, but as soon as the paddy cultivation is in full swing the boys are taken away from school to attend to the cattle. If primary education is made compulsory, cultivation will suffer to a certain extent.

25664. Do you think that tendency is peculiar to India?—Here the standard of living is very low and people do not work so hard, so that until the people change their habits and their mentality, it will be rather difficult.

25665. You have told us that you have in this Province 18,000,000 acres of culturable waste?—Yes.

25666. In answer to our Question 24 on page 60, the first measure you suggest is to lease out waste land on favourable terms. Is there any proposal before the Government to lease out any part of this land?—Waste lands are available for settlement on ordinary terms but there is no provision for specially favourable terms.

25667. Have you any suggestion to make as to how this area could be leased out to willing persons?—If we are to encourage farming by middle-class men, we shall have to aim at large farms. To open up such large areas will take a long time, and if full revenue has to be paid from the very beginning, I do not think even a gentleman cultivator will be able to make a start unless he has a very big capital. In some cases Government might help these gentlemen farmers by giving concessions, as they did in the case of the tea industry.

25668. In Japan were you in touch with the Young Men's Associations?—Yes.

25669. You had occasion to observe their activities and come in contact with them?—Yes.

25670. Can you tell us why we cannot organise similar institutions in our own rural areas?—It is a very difficult problem. In India, the real national spirit is wanting; there is not that feeling for national welfare and for institutions which have a real national value; that is the main defect. As we have not that spirit, it is very difficult for us to do anything of the sort in India.

25671. Have you made an effort in this Province to start an organisation of that sort?—We ought to try, but in Assam all the people possessing the best intelligence are looking for Government service and so are not in a position to participate in such organisations.

25672. *Mr. Calvert:* With reference to the last question put by Professor Gangulee, would you say the difference in the two countries rests with the leaders or in the people themselves?—The people are the raw material and the leaders are the organisers; unless we have good material, we cannot produce good things; so that I should say the difference in the people is a much more important thing than the difference in the leaders.

25673. But in Japan there are a large number of persons organising these 'getting-up early' societies, physical training societies and village improvement societies, while here you have not?—No, we have not got it. In Japan all organisations are backed by the State and there is a thorough system. When they want to start something new, they go out not only to one country but to all countries, to America, Germany, France, England, Sweden, Switzerland; they pick up the best ideas they can find and bring them back. When I was in Japan some Japanese ladies went to Sweden and Switzerland to study the question of physical culture of females; when they came back they organised it in Japan. At one college I found a military officer lecturing on the art of riding while in the same hall a commercial gentleman was lecturing on the art of packing

goods. That seemed very strange to us Indians. They go out to different countries, bring back the best knowledge they can find there, and inculcate their young people with that knowledge. In Japan every young person feels that he lives for his country; he thinks for his country. It is the same with Government servants, private workers and commercial people. It is not so in India.

25674. In Japan there is more effort towards self-improvement?—Yes, there the whole country is one; if you convince a Japanese street loafer that he should die for his country, he will do it. We do not find such things in India.

25675. In Japan is not night-soil frequently used as a manure for paddy?—Yes, both in Japan and China. But for the use of night-soil there would be famines in China and Japan.

25676. The night-soil from towns is used for the paddy fields?—Yes; in the City of Tokyo there are no sweepers to remove the night-soil; every household has a night-soil pit which it lets out to a cultivator, who pays Re. 1, Rs. 2 or even Rs. 5 for the privilege of clearing it for one year. There are also large drains to receive the sludge of sewerage, and at low tide cultivators come in boats to take away the sludge for use on their paddy fields.

25677. Is that extensive use of night-soil the cause of the higher outturn of paddy there?—I think so.

25678. Is there any hope of getting people here to use night-soil on the same scale?—That is impossible; we cannot think of using night-soil in India unless it has been allowed to rot for a long time.

25679. It is a question of prejudice?—Yes.

25680. So that prejudice is partly responsible for poverty?—Yes. There is one thing I think we can do; near towns on trenching grounds we might grow maize, Guinea grass and other green fodder and use them for feeding cows in towns.

25681. In Japan did you see anything of the consolidation of fragmented paddy fields?—When I was in Japan, they were starting that movement.

25682. You did not actually investigate the methods?—I did not investigate, but I heard of the movement. In Japan fragmentation went very far. In Japan they do not use cattle for agriculture; they use manual labour, so that fragmentation did not affect them so much; but they were taking up the consolidation movement and I learned that they were successful. Commissions were appointed consisting of two or three Commissioners for particular localities, and they used to go from village to village adjusting the holdings to agricultural needs.

25683. I presume the obstacles to be overcome were very similar to the obstacles to be overcome here?—It may be, but I think the laws of the country were possibly quite different.

25684. But the same questions as to differences of soil or proximity to water-supply would arise there as here?—Yes.

25685. Do you not therefore think there is some hope of consolidating fragmented paddy fields in Assam?—Yes, it is necessary; it is going to be very serious in the near future, because the Settlement Reports show we are having 3 to 4 acres of land for each household. In the next generation I think that will be reduced to one-third or one-quarter; but at present, as we have got plenty of fresh land, people can move on.

25686. Why is it that the Japanese make economic use of their rice straw for platting and for paper while in Assam it is not made use of?—The standard of industrial life is quite different in Japan; they live at very high pressure. Not only do they use rice straw, the Japanese cannot afford to throw away waste paper. There is no waste in Japan; all the waste paper is preserved and is used as weft in weaving certain rough carpet-like things. So that their position is quite different. In Assam we waste so many things; we waste timber, we waste fuel, we waste everything; life in India is full of waste. There is no comparison between life in Assam and life in Japan.

25687. So that you think waste is also a cause of poverty in this country?—Quite true.

The Commission then adjourned till 10 *a.m. on Tuesday, the* 14*th December,* 1926.

Tuesday, December 14th, 1926.

SHILLONG.

PRESENT:

The MARQUESS OF LINLITHGOW, D.L. (*Chairman*).

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S.
Sir THOMAS MIDDLETON, K.B.E., C.B.
Sir JAMES MACKENNA, KT., C.I.E., I.C.S.
Mr. H. CALVERT, C.I.E., I.C.S.
Professor N. GANGULEE.
Dr. L. K. HYDER.
Mr. B. S. KAMAT.

Mr. J. HEZLETT, I.C.S.
Rai Bahadur RAMANI MOHAN DAS. } (*Co-opted Members*).

Mr. J. A. MADAN, I.C.S.
Mr. F. W. H. SMITH. } (*Joint Secretaries*).

Srijut LAKSHESWAR BARTHAKUR.

Further Oral Evidence.

25688. *Mr. Kamat:* You received your agricultural education in Japan, and you said you stayed there three or four years?—Four years.

25689. Would you kindly help the Commission by telling us what is the system of agricultural education in Japan as a whole? If you like, you can commence from the agricultural college at the top and go down to the agricultural schools, or you may begin from the bottom and go up to the top?—I shall begin from the top. There were two important State Universities and an agricultural college, which was subsequently converted into University. Both the Universities have got agricultural colleges with excellent farms and fully equipped laboratories, and different branches of agriculture are taught there. In the Tokyo University they had an Agricultural Chemist from Germany; the rest of the staff were their own graduates who were trained in foreign countries for four or five years and even for a longer time.

25690. The majority were Japanese?—All of them were Japanese, except a very few experts.

25691. A few experts were brought from foreign countries?—Yes. The other college in which I studied, the Sapparo Agricultural College, which was converted into the Hokkaido University was organised by a staff of American Professors who remained there for four or five years to organise it.

25692. In all, how many agricultural colleges are there in Japan?—There are three colleges for the whole of the country.

25693. Below the agricultural colleges, what is the system of agricultural schools?—There are a large number of agricultural schools; I could not tell you the number, but just like high schools here there are a large number of schools with purely agricultural courses, and in all these schools they have got their own farms and laboratories.

25694. You mean regular farms or only small plots?—Regular farms. They have got excellent stations in every Province which co-operate with the agricultural institutions. Apart from agricultural schools they have got sericultural schools. Sericulture is an important subsidiary industry of the Japanese cultivators. But for sericulture a lot of Japanese would have died of starvation. Then, they have fishery schools; fishery is a very important branch of agriculture there.

25695. Below these high school agricultural classes what are the smaller schools?—I do not think there is any smaller school.

25696. If a boy of 14 years of age wants to begin his agricultural education, where does he begin?—He does not begin his agricultural education at 14. He begins it after passing the middle school course (which is our high school standard). After finishing his middle school course he will take to the special agricultural schools, and if he wants to study higher agriculture, he goes through the college course.

25697. *Prof. Gangulee :* There you have special secondary schools in each prefect?—I do not think in each prefect, but there are schools in very many centres.

25698. *Mr. Kamat :* And the instruction is given of course in Japanese throughout?—Yes.

25699. In the college course, the whole of the instruction is in the vernacular?—Yes. They put in the technical terms in English and in German on the board. All science students take up German as a second language.

25700. The scientific terms are given in the vernacular and German?—In English and German.

25701. Will you tell me how research work in Japan is co-ordinated? For instance, how is the research work on different problems in the various research stations in different Provinces co-ordinated?—They have got a central agency, the Department of Agriculture and Industries, and they have got under that agency special experts to supervise all these institutions.

25702. Will you describe the central agency in a little more detail? Is it an official agency or a semi-official agency?—It is an official agency;

25703. Purely official?—Yes.

25704. No non-officials serve on it?—It has no non-officials.

25705. It is in fact a department of the Central Government?—Yes; it is termed the "Department of Agriculture and Industries."

25706. What is the procedure for co-ordination? Is it done by the various officers in the Provinces being called to headquarters, or is it only by correspondence?—The expert staff of the department go out and consult locally.

25707. You mean the Central Government sends out research workers to the Provinces to visit the research stations; that is the method of co-ordination?—Yes; I was in Japan between 1905 and 1909, and matters must have changed a good deal by this time.

25708. I am asking only of the things that were in your time. At that time the method was that the Central Government sent out their officers to the different Provinces to watch what research work was being done?—Yes.

25709. *Rai Bahadur R. M. Das :* You say you have your headquarters at Jorhat. Is that a fairly central place from which you can conveniently look after your farms and demonstration circles in the different valleys?—Geographically it is not very central, but practically it is fairly satisfactory.

25710. If you consider it a convenient place from which to look after the farms and the work of your officers, would it not be an equally convenient place for the headquarters of the Director of Agriculture?—I am not quite sure about that, because the Director of Agriculture is the administrative head, and he has to be in close connection with other heads of the administration and with the Government. Perhaps it is better for him to be at the seat of Government than away from the capital.

25711. Would it not save a lot of his time and a lot of expense to Government in visiting the different parts of the Province?—The Director has not got to visit these localities so often. He has got to go out on periodical tours. I do not think it matters much, his headquarters being stationed at Shillong.

25712. How long does it take to go from Sylhet to Shillong?—Two days.

25713. From Jorhat you can reach Sylhet in 24 hours?—Yes.

25714. In Jorhat you have got a farm and also a laboratory?—Yes.

25715. It is an important place from an agricultural point of view?—Quite so.

25716. You stated yesterday that you have got four farms in charge of Managers and Assistant Managers. Are they all graduates of agricultural colleges?—With the exception of one they are.

25717. Which one?—The one in Jorhat.

25718. What agricultural training has the Manager of Jorhat farm had?—He has had practical experience.

25719. What agricultural education?—Academic education he has had none. But he has had practical experience by serving in the Jorhat farm, Dacca farm, and working in the Khagrabori sugar farm; and he was subsequently appointed as a Farm Manager.

25720. He has no agricultural education. You have an Assistant Manager in charge of the Karimganj farm?—We have an Assistant Manager, but he works under the Manager.

25721. He is sometimes put in charge of the farm?—Yes.

25722. What agricultural education has he had?—I could not tell you. I understand he was in Bengal for some time and was trained in farms there.

25723. Your Inspectors are all graduates of agricultural colleges; are they not?—Yes, all of them.

25724. Are some of them also Inspectors of Co-operative Societies?—Only three.

25725. Have these three Inspectors any knowledge of economics?—They have been given training in co-operative organisation; that is all that I know about it.

25726. What training in co-operation have they received?—The Assistant Registrar gave them the training.

25727. Have they studied co-operative literature?—I am not quite sure how far they have studied it, but as they are put in charge of co-operative organisation, they must be in touch with the literature of the movement.

25728. You have got 56 demonstrators, and you pay them from Rs. 30 to Rs. 50?—That is the permanent scale.

25729. Have they any theoretical knowledge of agriculture?—No; they have practical training on the farms.

25730. Your Director told us yesterday that the cultivators are sometimes reluctant to allow your demonstrators to demonstrate on their fields. Is not that reluctance due to the fact that the cultivators, and with some reason, believe that they have nothing to learn from your demonstrators?—When the demonstrators were first introduced the people were reluctant to allow them to demonstrate, but afterwards when they come in contact with our work and are impressed with the good results they generally co-operate with us.

25731. Do you think that your demonstrators know more about cultivation than these old cultivators who have been cultivating their lands throughout their lifetime?—Generally speaking, they know more than the cultivators, because they are recruited from the rural areas; in addition to that they are in touch with the departmental activities, and they are also trained both on the farm and by the Inspectors specially.

25732. How long are they trained?—They are supposed to be two years on probation and two years on the farm.

25733. Do you think they acquire more practical knowledge of agriculture than the cultivators during this period of two years?—According to my experience, a large number of them are really good agriculturists.

25734. How many Inspectors have you?—15.

25735. Have you not got 56 demonstration circles?—Yes; there are 56 demonstration circles.

25736. After doing the inspection of these 56 demonstration circles, do you find sufficient time to plan experiments in the agricultural farms in your charge?—Demonstration is supervised directly by the Inspector, and his work is supervised by the Superintendent; the Deputy Director scarcely finds any time to supervise the demonstrator's work.

25737. I am speaking of planning, not supervising. In answer to a question by Professor Gangulee, you said yesterday that you plan experiments in the four agricultural farms; I ask you, do you find sufficient time

to do that?—The cropping programme is prepared by me. I also work out the general plan of work.

25738. Do you find sufficient time to plan the experiments in the four agricultural farms of which you are in charge?—So far as the preparation of the plan is concerned, I find time to do it, but I cannot attend to the details of the work and supervise the details.

25739. Practically, you cannot properly supervise?—Of course, a man cannot be in all the places at the same time.

25740. You told us yesterday that in Japan night-soil is used as manure, and that the people in India are prejudiced against it?—Yes.

25741. Do you know that the Shillong trenching ground and also the trenching ground in Dibrugarh are leased out to the cultivators by the Municipalities at a high rate of rent, for use on garden land?—I am not aware of it.

25742. I tell you it is a fact, and there is no prejudice against using the trenching ground?—The position is somewhat different. Here the night-soil is buried for some time, and there is no obnoxious smell, but in Japan they use it directly; as we handle cattle manure so they handle night-soil, that makes a good deal of difference. I do not think any cultivator will touch night-soil with his own hands, but in Japan every cultivator will handle it even when it is fresh.

25743. You said yesterday that water-hyacinth is a great blessing in the Assam Valley; is that so? That statement requires to be qualified?—It would not be so injurious as it is in other places, and it could be utilised for purifying the ponds and small tanks.

25744. You have often toured in the Surma Valley; do you know that water-hyacinth is doing considerable damage to the rice fields and blocking up the navigable channels in the Surma Valley?—Yes, I know it. I started an enquiry in that connection first in 1915 and I submitted a note, and again later on in 1920, I submitted another note; in those notes I have pointed out all these difficulties.

25745. Have not the Local Government passed a law to eradicate the evil?—Yes.

25746. Are not measures being taken by the Local Boards to eradicate the evil?—It is easy to pass the law.

25747. *Sir Henry Lawrence:* How will it be eradicated by law?

Rai Bahadur R. M. Das: The Government have passed the law, and measures will be taken by local authorities, by helping the people and compelling them, to root out this evil.

25748. *Sir Henry Lawrence:* Is there such a law?

Rai Bahadur R. M. Das: They have passed the law; the Local Boards have been authorised to compel the people to root out the evil.

Mr. Hezlett: The local authorities can take special measures themselves to remove water-hyacinth from the waterways.

25749. *Sir Henry Lawrence:* Is it difficult to enforce it?

Mr. Hezlett: The law is there, but it is difficult to enforce it.

25750. *Rai Bahadur R. M. Das:* You said something about water-hyacinth as manure; have you demonstrated the use of water-hyacinth as manure to our cultivators?—Yes.

25751. What is the result?—It has given good results.

25752. You said something yesterday about the high price of milk; is not the high price of milk due to a larger demand for milk, to an increase of population, and to a shortage in the supply of milk on account of heavy cattle mortality and degeneration of the breed of cattle?—Yes.

25753. Is not the shortage of milk-supply affecting the health of our people?—I think so.

25754. Would it not be desirable to amend the Cattle Trespass Act, so as to provide that the fines realised from impounded cattle should be earmarked for the improvement of cattle?—Yes; in my enquiry on cattle I have laid some stress on the point.

25755. You said yesterday that the Local Boards might object; do you think they would object if they got sufficient help from Government for

primary education or for their roads? Would they object to earmarking the fines and fees realised from impounded cattle for the improvement of cattle, if the revenue that they now derive from this source were paid by Government from their own resources?—Of course if their resources are increased, I do not think they will object. Anyhow, it appears to me that the income derived from cattle should be utilised for the improvement of cattle first.

25756. Is there any dairy industry in this Province?—In a petty way there is.

25757. Is there any organised dairy industry?—There are very few dairies; there are some in Shillong.

25758. Do you think that any dairy industry started by a private individual should be subsidised by Government?—If Government could do it, it would be a good thing.

25759. How many honorary correspondents have you got?—I could not tell you the number exactly.

25760. I suppose there are about 23; have you ever tried to induce any one of them to start a dairy concern?—We have not made any experiments in that line.

25761. You spoke of Agricultural Associations in Japan; have you ever asked any of your honorary correspondents here to start similar associations in this Province?—We have tried to start such associations, but till now we have not been able to do it.

25762. You say on page 52, "There is a strong contrast between the powerful and heavily-built Assamese buffaloes and the stunted and miserable looking cattle in Assam." Does that remark apply to the Sylhet district or to the Surma Valley?—It applies mainly to the Assam Valley.

25763. Not to Sylhet, because the conditions in Sylhet are quite different.

25764. How do you propose to tackle the fodder problem in Assam? Has each cultivator in Assam Valley proper got sufficient *neej gochar* (private pasture land) from Government? All the land in Assam belongs to Government?—Yes.

25765. Have Government given to each cultivator a sufficient area of land for grazing his cattle?—No; it has not been given separately to each individual for grazing his cattle, but, if they like, the people can keep some of their land for grazing purposes.

25766. Would you not suggest that, during the settlement operation which is going on now, each cultivator should be assigned such land at a low rate of rent?—That is my suggestion; I explained yesterday the system of *neej gochar* according to my idea; if Government grant a piece of land at a lower rate of rent for *neej gochar*, that will induce the cultivators to keep some of their land for the purpose. I would go further; I would compel every cultivator, wherever possible and practicable, to keep a small area of land as *neej gochar* for which a low rate of revenue should be assessed.

25767. You think, during the present settlement operations, it can be easily arranged?—Yes, that is my belief.

25768. You are now in charge of the distribution of seeds?—Yes.

25769. You make all the necessary arrangements for distribution?—Yes.

25770. You distribute seed potatoes from Shillong to the plain district?—Yes.

25771. Will you tell me where you got these seeds this year?—This year we got our seed potatoes partly from the villages which were supplied with our farm seeds and partly from the bazaar.

25772. What is the good of buying seed in the bazaar and then sending it to the co-operative societies?—The supply of suitable seed potatoes is a big problem. After we have sent our seed from our farms, we are not in a position to control its cultivation and we cannot take any measures against potato diseases. We tried our best to distribute our seed to some localities or villages but I think the supply from them was not sufficient and therefore we had to purchase some from the market.

25773. You say that you bought your seed from selected cultivators. Did you carefully supervise the work of preserving that seed?—I could not do that and it is not possible also because the ordinary seed purchasing cultivator is not prepared to pay a higher price for the seed. The ordinary practice is that he plants whatever he can get in the market. A few good cultivators might appreciate the value of good seed, but the ordinary cultivators are satisfied with any seed provided it is as cheap as possible.

25774. Is it not a fact that last year the co-operative societies in the Surma Valley refused to take your seed on account of heavy rottage in the previous year?—I do not know the operations of last year; I have had experience of this year. The whole question of the supply of seed potatoes depends on the transport facilities. We have got to supply seed at long distances under unfavourable conditions. We have got to transport large quantities. Possibly in the case of these large departmental transactions, we cannot give sufficiently careful handling. The ordinary petty traders, however, can better look after their small lots of seed.

25775. Is your seed treated before distribution?—It is not possible to treat any seed unless the cultivators are prepared to pay a higher price, which they are not willing to do. They would rather have our untreated seed at 3 or 4 annas less in price.

25776. You seem to attach much importance to the inculcation of the real spirit of co-operation among the people. Do the Inspectors of co-operative societies find sufficient time for this sort of work after doing their ordinary routine work of auditing the accounts of the societies?—We have got only three Agricultural Inspectors working as Co-operative Inspectors and their co-operative work is not extensive.

25777. Do you think that these Inspectors find sufficient time to do this educational work after doing the routine work of auditing?—This work has been given to our Inspectors only for a year and I am not in a position to give my considered opinion on the matter. From my past experience, however, I can say that it is a mistake to entrust the work of organisation and of audit to one staff because, the moment a man has got a large number of societies, he will naturally be reluctant to organise more societies and thus increase his work. Besides, in the work of co-operative organisation the people in the Assam Valley and also in the Surma Valley have got to be trained specially. There should be regular preaching and propaganda work in the villages and for that work I do not think that either the Agricultural Inspectors or the Co-operative Inspectors can have sufficient time unless their number is increased by three or four times.

25778. Do you know that the people look upon co-operative societies as so many cheap loan agencies?—The work done by the co-operative societies has not been spread all over the Province.

25779. I am referring to those places where it has been organised?—The people who are in touch with these societies do regard them as cheap loan agencies.

25780. Is it not because they are not trained up in co-operative principles and co-operative practices that these people look upon these societies as so many cheap loan agencies?—Quite so.

25781. *Sir Henry Lawrence :* In regard to this question of water-hyacinth, have any rules been prepared under the Act?—I do not know; I am not aware of any rules.

25782. Do you know if any action has been taken under the Act?—I am not in touch with that work; it is under the Local Boards.

25783. Does it not affect agriculture?—It does, but this portion of the work has been handed over to the Local Boards. Under the agricultural budget a certain amount of money is granted; it is handed over to the Local Boards and they spend it and organise the work.

25784. Some money is granted by Government to the Local Boards?—Yes.

25785. Do you know how much money is granted for this purpose?—I could not tell you.

25786. Can you find out and let us know?

Mr. Hezlett: We will find out that information * for you.

25787. *Sir Henry Lawrence:* Have the Local Boards got any executive officers appointed by Government?—They have got their Overseers.

25788. Are they the senior officers in the employment of the Local Boards?—Yes.

25789. Is there any chief officer or executive head? What is the working of the Local Board system here?—I am afraid I am not able to answer that question.

Mr. Hezlett: There is a Board Engineer who is also the chief executive officer; there is no secretary.

25790. *Sir Henry Lawrence:* What pay does that officer receive?

Mr. Hezlett: The bigger Boards pay from Rs. 200 to Rs. 500 and the smaller Boards from Rs. 250 to Rs. 400; he is not a very highly trained officer.

25791. *Sir Henry Lawrence:* Would he have authority to act in matters like the water-hyacinth problem?

Mr. Hezlett: He is the only executive officer.

25792. *Sir Henry Lawrence:* Would the initiative in regard to any action taken for the suppression of water-hyacinth vest in that officer?

Mr. Hezlett: The Chairman of the Board will have to be moved first in the matter and then action will be taken directly by the Engineer. In fact, we have no proper establishment to deal with water-hyacinth except the ordinary Engineer.

25793. *Sir Thomas Middleton:* In answer to a question yesterday, you said that the cattle in the Province were supposed to suffer from some deficiency in the mineral constituents of their feed. What is the deficiency?—It might be lime; I am not in a position to say definitely; the point has got to be investigated.

25794. Have you noticed that in any district of the Province the cattle eat earth?—That is a common practice.

25795. Do they also eat excrements?—I have not noticed that.

25796. In your supplementary paper on Irrigation you advocate power pumping for *boro* cultivation. What lift of water had you in mind when you advocated that?—Water does not require to be lifted very high for *boro* cultivation in this Province, generally from four to six feet.

25797. So you want a low lift and not a lift which will pump up water from 20 or 25 feet?—We want a low lift.

25798. *Mr. Hezlett:* As regards the question of the headquarters of the Director of Agriculture, the facts are that Jorhat is 27 hours by rail from Sylhet and Shillong is 40 hours; it is not exactly one day and two days respectively?—Yes.

25799. Then about the question of reservation of plots in a cultivator's holding for grazing purposes. Do you think that it would be practicable during the present resettlement operations to have these plots reserved? Do you think it would be popular if the Settlement Officer laid it down that certain plots bearing valuable crops like sugarcane or cold weather crops should be reserved for grazing ground only?—I think they will welcome it. Near Jorhat they have been compelled to keep small plots fenced in order to let the grass grow. There the grazing problem is very difficult and they have got to keep some land reserved for grazing purposes; they are small plots. But in places where there is no such heavy pressure of cultivation, I think, people will be able to do it without feeling it.

25800. I quite agree that it would be an excellent thing if we could reserve some land, but I am considering whether it is practical or not; that is the important point?—There is no harm in trying it.

25801. You say the price of milk is dear because the cattle are very poor, but I have seen it stated somewhere that the actual milkman or the *gowala* sells his milk at about Rs. 3 or 4 or 5 a maund or 1 anna a seer while we have to buy that milk at 4 annas a seer. Is it not a fact also that the high price of the milk is due to the fact that the man between the actual milkman and the consumer takes the profit, as much as 3 annas a seer? Could that not be remedied by the introduction of some kind of co-operative buying societies or selling societies?—They would be useful no

* A sum of Rs. 5,000 was allotted to the local bodies in the Surma Valley in 1919-20 and a further sum of Rs. 10,000 in 1921-22 for eradication of water-hyacinth.

doubt. I have stated in my Cattle Report that the price paid by the consumer is not received by the actual producer. But by limiting the number of middlemen, or reducing their number or their profit, we should be able to get the milk cheaper. That, however, does not affect the question of milk-supply; the supply is so very short.

25802. But 3 annas is too big a percentage to go into the hands of the middleman?—That is true, but our main problem is to increase the supply.

25803. *Prof. Gangulee:* Do you organise shows or exhibitions here:—We do.

25804. In village areas or in towns?—Originally we used to organise them in towns and even now we have to organise them in towns; but we have got the idea of taking them to the villages.

25805. So that up till now your shows and exhibitions have been confined to towns?—Yes.

25806. With 18 million acres of culturable waste, as you say, in this Province and with favourable climatic conditions, Assam has agricultural advantages for which it would be difficult to find a parallel in any part of India; do you agree with that view?—I do.

25807. And the average annual net expenditure on agriculture for the last ten years is about 1.11 per cent of the total average annual expenditure of the Province and you feel the necessity of spending a little more on agriculture. Can you think of any source which may be explored for obtaining the additional funds which you would like to have? Have you thought out any scheme in your mind?—I have thought over the matter. There is one way, I think, which would be helpful and that is by organising a professional grazing industry and releasing more areas from the unreserved State forests for this purpose. We have, just at present, 15,592 square miles of unclassed State forests. If we can get about one-third of it, say 5,000 square miles, I should think we can get a good revenue. We can get an income of about Rs. 200 or 300 per square mile by extending this professional grazing industry. At present I think we derive an income of about three lakhs from the grazing tax. It is very unpopular now, but if we really study the problem connected with this industry and go out to help them by organising credit amongst them and by helping them in preventing over-stocking of grazing reserves, I think we can improve their condition, and taxation will not be so heavily felt by them.

25808. That is your idea?—Yes; if this is done we can increase our revenue by a few lakhs of rupees.

25809. *The Chairman:* What is the attitude of the Forest Department towards the cultivators who wish to take up forest land and cultivate it?—I could not tell you; it is a forest policy.

25810. Are you familiar with the sericultural industry in this Province?—Just a bit.

25811. On page 19, paragraph 27, in the series of preliminary memoranda * prepared for the Commission there is a note on sericulture, "The total value of the silk industry produced in Assam is estimated at about Rs. 30,00,000." But in the Census of India Report of Assam, 1921, on page 163, paragraph 156, there are these words, "Of the 490 (persons) recorded under (rearers of) silkworms, 483 depend on *eri* or *muga* worms and only 7 on *pat* worm rearing. All these figures are obviously too low; in many cases doubtless the occupation is subsidiary to one of the textile groups or to cultivation, while admission of breeding the *pat* worm is shunned as it has usually been regarded as degrading". I find difficulty in reconciling those two sets of figures, even allowing for the fact that the statement in the Census Report is an underestimate. Do you know at all how many people are engaged in sericulture in this Province?—I have got no idea. I have not studied the census figures, but to my mind Rs. 30,00,000 would not be an underestimate. Silk-rearing as a subsidiary occupation must have been omitted from the census figures.

25812. It is not the amount but the number of workers that is said to be an underestimate. But you are not familiar with the position?—No; I have not studied the problem.

Mr. Hezlett: In 1918 Mr. Basu, the Deputy Director of Agriculture, made a report and he estimated the value of the total silk industry in Assam at about Rs. 30,00,000.

(The witness withdrew.)

* Not printed: Preliminary Memorandum prepared for the Commission by the Assam Government.

APPENDIX.

Receipts and Expenditure of Local Boards in Assam during 1925-26, under some particular sub-heads concerning cattle and cattle improvement.

	Income from cattle.	Expenditure in connection with cattle.				
	Receipts from cattle pounds (Cattle Trespass Act).	Cattle-pound charges.	Cattle fairs.	Veterinary charges.	Bull and stallion charges.	Contribution to Government on account of services of Veterinary Assistants lent.
	RS.	RS.	RS.	RS.	RS.	RS.
1. Silchar	7,341	216	..	1,395	..	1,560
2. Hailakandi	1,427	144	400	961	..	780
3. North Sylhet ..	8,362	314	..	1,817	..	1,458
4. Karimganj	5,329	108	..	1,836	..	1,560
5. South Sylhet ..	5,802	108	..	1,543	..	1,560
6. Habiganj	8,663	168	..	988	..	780
7. Sonamganj	10,266	116	..	2,189	..	1,560
Total, Surma Valley ..	47,130	1,114	400	10,729	..	9,258
8. Dhubri	12,289	1,072	..	3,414	..	1,529
9. Goalpara	5,714	8	..	2,152	..	1,459
10. Gauhati	10,155	948	..	2,096	..	1,608
11. Barpeta	3,360	..	..	1,830	..	1,560
12 Tezpur	12,864	581	..	2,864	..	1,560
13. Mangaldoi	7,649	..	..	1,356	..	1,486
14. Nowgong ..	21,645	45	..	1,903	..	1,560
15. Sibsagar	7,388	1,219	..	2,284	314	1,560
16. Jorhat	9,218	357	..	1,420	..	1,560
17. Golaghat	6,310	1,391	..	1,876	..	1,560
18. Dibrugarh	9,469	53	..	1,825	..	1,560
19. North Lakhimpur ..	6,654	..	..	1,411	..	1,560
Total, Assam Valley ..	1,12,715	5,674	..	24,431	314	18,552
Total, Assam Province ..	1,59,845	6,788	400	35,160	314	27,820

Dr. S. K. MITRA, M.S., Ph.D., I.A.S., Economic Botanist, Assam.

Replies to the Questionnaire.

QUESTION 1.—RESEARCH.—(*a*) (*i*) *Organisation.* To organise better research and lessen the topheavy administration, the posts of Deputy Directors may be abolished and they may be appointed as experts to carry research work on the lines they are well acquainted with. This will automatically increase the provincial research staff and laboratory work with necessary equipment. On the other hand, the Superintendents will be in charge of demonstration and seed distribution directly under the expert Director. If need be, there may be appointed a provincial Deputy Director of Agriculture to help the Director in administrative work and especially in demonstration and seed distribution. If this principle were followed, the organisation of the provincial agricultural research and administration could be well organised economically.

2. The provincial expert staff should preferably be drawn from able and efficient research workers, and there should be more experts and assistants appointed. The present pay of the assistants is not very encouraging. Better pay and prospects should be offered to them if efficient work is desired.

3. Indianisation of the Agricultural Service will surely help in improving the status of the agriculturists at comparatively less cost, as the officers have to deal with mostly illiterate men. But, where necessary, efficient experts may be appointed on contract for short terms to organise the provincial research activities.

4. As the Provincial Governments are not in a position to appoint experts in various lines of research, the Government of India might open a branch station of Pusa Institute in each Province and tackle the problems that can hardly be taken up by the provincial expert staff.

Administration.—The Department of Agriculture should be a separate department by itself and the Veterinary Department may be amalgamated with it. An expert should be appointed as Director. The case of Assam is an anomaly. The Department of Agriculture is amalgamated with two others, *viz.*, the Co-operative and Industries, under a layman Director, promoted from the Provincial Civil Service and no satisfactory work in either research or welfare of the common agriculturists is possible so long as the status of the department remains unchanged. A separate agricultural department is the first and foremost requirement of Assam.

2. The research staff is limited to one expert officer, as Economic Botanist and he is in charge of Chemical, Entomological and Horticultural sections in addition to his own duties. More experts and assistants should be appointed.

Financing.—The money allotted at present for provincial agricultural work is far below the demand. As agriculture is the only institution of 80 per cent of the people of the country, Provincial Governments should spend more money on it. Besides, attempts should be made both by the Provincial as well as the India Government to start a campaign for liberal donation from private sources. The Government of India may also offer a yearly grant to the Provincial Governments according to their need to help and promote the cause of research.

(*ii*) A provincial veterinary research laboratory in connection with the agricultural laboratory is highly desired only in those Provinces where there is no veterinary college.

(*b*) Progress in Assam has not been made owing to the lack of skilled workers in the following:—

(1) *Dairy.*—Assam cattle are perhaps the poorest in India, and work on this line is urgently needed.

(2) *Horticulture.*—Orange is the most important fruit industry in Assam. Skilled workers to improve the cultural, manurial, handling and marketing problems are wanting.

(3) *Mycology.*—The potato is the staple crop of the Khasi and Jaintia Hills. Immediate appointment of skilled workers to control the *phytopthora* disease is urgently needed.

(4) *Chemistry.*—Assam proper grows only one crop, rice. The soil being distinctly acid and lacking in adequate amount of humus, *rabi* crops can hardly be grown. The poverty problem of the people here could partly be solved with the introduction of a second crop in winter by treatment of the soil. The re-appointment of a Chemist (the post has already been kept in abeyance) is urgently required.

(5) *Economic Botany.*—(*i*) Cross-breeding of rice to serve both scientific and economic purposes, although it is done to a certain extent to serve the latter.

(*ii*) Both field and laboratory studies on the general question of environmental influence upon the quality of rice, especially the protein content as affected by the length of the growing season, of the time of harvest, of the time of sowing the seed and transplanting or broadcasting, of the amount of water-supply, the influence of the soil and other allied problems.

(*iii*) A few other problems of direct interest to the cultivators are—

(1) Deep *versus* shallow ploughing.
(2) Drill *versus* broadcast seeding.
(3) Rotation of crops.
(4) Clearing the land from weed both by cultural methods and by chemical sprays.
(5) Irrigation of rice field from wells.
(6) Improving the milling quality of rice.
(7) Use of combined harvester.
(8) Discing *versus* ploughing the land.
(9) Green manuring rice fields.
(10) Change of seed.

(6) *Entomology.*—(*i*) Campaign against cut-worms (*agrotis*) in Karki-Katura in Sylhet district in onion and potatoes.

(*ii*) Dissemination of knowledge about the control of insects.

(*c*) Research can be taken up on—

(1) Pure line and selection, and storage of potatoes.
(2) Disease resistive varieties of potatoes.
(3) Packing and marketing of oranges.
(4) Grasshopper control in Hazo, in the district of Kamrup.
(5) Reclamation of swamp land in lower and middle Assam Valley.
(6) Canning and preserving of fruits and vegetables.
(7) By-products of oranges.
(8) Development of mustard, jute and cotton which are important agricultural products.

QUESTION 2.—AGRICULTURAL EDUCATION.—(*i*) No. Assam has no agricultural institution.

(*ii*) Yes. In Sylhet, Kamrup and Sibsagar districts.

(*iii*) Not necessarily.

(*iv*) No. Agricultural education should be given free on a liberal basis. To stimulate the demands for instruction in agriculture, agricultural courses should be included in the University curriculum, and in the primary and secondary schools as nature study training. Except college education a separate agricultural school for the training of the boys of agriculturists will seldom be a success.

(*v*) As there is little or no opening in either Government or private service for boys of the middle-class with a training up to Matriculation standard, they want to get a training in agriculture either to get into a service or take up agriculture as business, while purely cultivators' sons have little or no chance to be trained in their profession and so they are not inclined to send their boys to school. Courses should be offered in such a way that they may help them directly. Nature study training, if introduced both in primary and secondary schools, will serve the purpose.

(*vi*) Mostly not for above reasons.

(*vii*) Agricultural courses may be offered as electives together with the regular courses.

(*viii*) (*a*) Nature is the best method to train cultivators' boys in primary schools in the villages where they mostly begin and finish their training.

(*b*) School plots are essential in giving nature study lessons.

(*c*) School farms will succeed in places where the land and implements are obtained free.

While the majority of our boys do not go beyond high schools, nature study is the best system of training for the boys who seek agriculture as vocation. But, above all, what is required most is the facility for primary education in rural areas which is wanting.

(*ix*) In Assam the boys trained in agriculture are quite a few. They have mostly been appointed by the Department of Agriculture.

(*x*) Agriculture should be added in the curriculum of high schools and agricultural training should be given in the form of nature study training with school plots as electives in addition to training in the 3 R's. There should be lectures in school rooms and practicals in the school plots. With the affiliation of the agricultural courses in the schools the hatred for agriculture is sure to be removed.

(*xii*) Adult education can be popularised by starting free night schools in villages, where illustrated lectures with lantern slides on various subjects, such as agriculture, public health and sanitation, and social welfare, are always instructive and entertaining.

(*xiii*) (*a*) The administration of rural schools may preferably be in the hands of the District or Local Boards. A provincial advisory board for rural education is desired with the Director of Public Instruction as Chairman.

(*b*) The Government of India may offer a grant to the Provincial Governments as primary education grant and thus lay the foundation for rural education.

2. Both the India Government and Local Governments may seek donations from private sources for the purpose.

3. Municipalities, District and Local Boards should contribute substantially for rural education.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(*a*) Demonstration in cultivators' fields has been successful in Assam. There is no Government demonstration farm in Assam except one in Haflong Hill. No propaganda work has yet been tried except in agricultural shows. Demonstration staff should be increased.

(*b*) Demonstration will be much more effective if some *bona fide* cultivators are supplied with seeds and commercial fertilisers free of cost or at least at concession rates. They will then have an incentive to use them to advantage.

2. Demonstrators should be recruited from better trained men with better pay. The present pay does not encourage qualified young men to go in for it.

(*c*) Cultivators must be given to understand that no extra tax will be levied by growing a better crop through the advice of the experts. The expert opinion should be given according to cultivators' ability to utilise it to advantage. Above all, unless the cultivators get the rudiments of knowledge in reading and writing, they will seldom realise the advantage of expert advice.

(*d*) Other things being equal, demonstration work is always successful in some places where the cultivators are willing workers and want to do something better. Furthermore, demonstrations in middle-class farmers' fields are in most cases successful, as they follow the expert advice and get a better result.

QUESTION 4.—ADMINISTRATION.—(*a*) Yes. The co-ordination of the activities of the Government of India may usefully supplement the activities of the Local Governments. But this does not mean the decrease in the provincial expert staff and consequent increase in the India Government staff at Pusa. In any case, the provincial expert staff should be increased.

(*b*) Yes. So far as Assam is concerned there is no Mycologist, Chemist, Bacteriologist, Horticulturist, Entomologist, Dairy Expert Animal Breeder, Agronomist, Soil Physicist or Agricultural Educationist to organise their

respective lines of work. The Government of India may have a branch station in each Province and take up such problems as need be. There must be some permanent Assistants at these stations to carry out the work.

(*c*) (*i*) No. In Assam, the lack of sufficient skilled workers to work with is evident, as there is only one Economic Botanist in charge of the Chemical, Entomological and Horticultural sections in addition to his own duties. Unless more experts and assistants are recruited, no satisfactory results in agricultural work are possible.

(*ii*) No. In Assam, there is no arrangement in railroad and steamer services for the transportation of fish, fruits and vegetables. Refrigerator cars should be provided for them.

(*iii*) No. Good roads should be maintained in every important centre. The trunk road from Gauhati to Dibrugarh should be metalled, if possible.

QUESTION 5.—FINANCE.—(*a*) The Government of India may start a campaign to raise money as agricultural loan, like the War loan. As the country is now wide awake to the needs of agriculturists, an agricultural loan campaign will be highly responded to from all quarters both at home and abroad. This money may be disbursed according to needs of the Provinces for both long and short-term credit.

The Provincial Governments ought to spend more money towards a better financing of the agricultural operations, as they do for the Education Department.

(*b*) Agricultural officers should advise them in their activities and make them realise the significance of honesty in business.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(*a*) (*i*) The main causes of borrowing—

(1) The extreme poverty of the cultivators.
(2) Social customs.
(3) Failure of crops due to drought, flood, or insect pests.
(4) Disease and death.
(5) Lack of sufficient labour.
(6) Oppression of the *mahajans* or moneylenders.
(7) Rise in market price due to unnecessary exportation of rice from the Province, which compels the cultivators to buy at high price for consumption in rainy season, as they are sold out of stock to pay the creditors.

(*ii*) The sources of credit are—

(1) Borrowing from *mahajans* or moneylenders at prohibitive interest.
(2) Mortgaging ornaments and property to moneylenders or other individuals.
(3) Advance sale of crops at very low price.

(*iii*) The reasons for non-payment are—

(1) Failure of crops.
(2) Prohibitive interest which is mostly calculated as compound interest. (The moneylenders very often cheat the cultivators in calculation.)
(3) Disease and death.
(4) Zamindar's tyranny.

(*b*) (1) Agricultural associations should be formed in each circle and buying and selling should be done on co-operative principles which will help the farmers to grow a crop and get a satisfactory profit out of it. Each particular staple crop should have an association of its own, such as the rice growers' association, the orange growers' association and so on.

(2) More agricultural loans to cultivators (commercial growers).
(3) Co-operative societies in each circle.
(4) More co-operative credit to the cultivators.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—(*a*) Yes.

Suggestion—

Co-operative growing of crops or joint farming.

(*b*) *Obstacles*—

(1) Lack of sufficient labour and good implements.
(2) Lack of sufficient rain water and irrigation facility.

(3) Lack of co-operation among the cultivators.

(4) Lack of sufficient capital to buy one whole area.

(5) Family partition.

Remedies—

(1) Introduction of improved machinery, draught bullocks and, if possible, motor power.

(2) Levelling the land, so that the water does not collect in one place.

(3) Irrigation facility. In Assam, the cultivators depend on rain water, which is generally stored in the field for rice cultivation by *ails* and raised dams in small areas.

(4) Co-operation.

(5) Labour supply.

(6) Agricultural loans.

QUESTION 8.—IRRIGATION.—(*a*) (*ii*) In Sylhet district the present method of using the switch basket or *don* in irrigating the *rabi* crops and to a certain extent the rice fields, where the water is available in ponds or ditches, is quite helpful provided it is used extensively.

(*iii*) Owing to irregular rainfall a vast area of the cultivated land remains idle every year for lack of sufficient rain water. Shallow wells from 10 feet to 12 feet deep dug in the field will do away with the difficulty to a certain extent for petty cultivators. Cultivators in Assam do not use well water in the field. They may be induced to do so.

Obstacles.—(1) Irrigation canal is not possible in Assam proper.

(2) Financial conditions will not allow the digging of tanks or ponds.

Remedies.—*Kutcha* wells may be used to advantage. Water may also be obtained in small streams by raising concrete dams.

QUESTION 9.—SOILS.—(*a*) (*i*) Assam soils are distinctly acid and so the application of lime is recommended. Apart from rice and jute land, the rest of the higher levels, where *rabi* crops, sugarcane, cotton and fruits are grown, require drainage. Furthermore, Assam soil lacks in sufficient humus and available nitrogen. Humus should be supplied either by green manuring or application of farmyard manures.

(*ii*) There are vast tracts of swamp land in Assam bordering the Himalayan region (the great Tarai swamp, as it is known) which may be reclaimed for homestead settlement. Middle-class cultivators, co-operative farming and capital farming are required to reclaim them. The land is suitable for rice and jute in Lower Assam and for *rabi* crops, cotton, wheat, barley, etc., in the middle, and rice and *rabi* crops in Upper Assam.

(*iii*) For the prevention of the erosion of the hill regions by heavy rains where potatoes and cotton are grown, terrace system of cultivation is recommended. This will check the *jhum* system or itinerant cultivation in hill sides, and instead will establish permanent homestead settlements with increasing revenue to Government.

(*b*) (*i*) Jorhat farm soils are distinctly acid; *rabi* crops, sugarcane, wheat, oats and barley were grown after sufficient lime was applied. There are many places in Assam where the soils are similar.

(*ii*) At Jorhat, the experimental plots produced excellent sugarcane when they were under the supervision of the Chemist four years ago, while the same plots have now deteriorated and produce poor canes. The appointment of a Chemist is urgently necessary in Assam.

The people of Sibsagar, which is known to be a well-known productive rice-growing district, applied to the Settlement Officer, Sibsagar, a year ago to reduce their tax because they cannot produce good crops nowadays as they did a score of years ago.

QUESTION 10.—FERTILISERS.—(*a*) As artificial manures are too costly for the poor ryots, they should use farmyard manure economically by collecting it in a pit in the form of a compost with a thatched roof above. This is being recommended by the Department of Agriculture, Assam.

(*b*) By law.

(*c*) By experiment in Government farms and demonstration in cultivators' fields.

(*d*) In Khasi and Jaintia Hills, the use of bonemeal in rice fields has recently increased. Application of farmyard manure from pits has increased in Upper Assam Valley within the last two years.

(*e*) No, not quite. Phosphatic manures were found to be giving very good results in sugarcane at the Jorhat farm and bonemeal on rice in Karimganj farm. These are being successfully demonstrated outside.

(*f*) Cowdung is seldom used as a fuel in Assam.

QUESTION 11.—CROPS.—(*a*) (*i*) The existing crops may be improved by—

(1) Using pure seed of high-yielding capacity as recommended by the department and continuing to keep it pure.

(2) Using farmyard manure and application of water by switch basket where needed.

(3) Using better ploughs and ploughing deep.

(4) Sowing in proper time.

(5) Fencing the crop.

(6) Adopting some system of rotation.

(*ii*) The cultivators are averse to try anything new, but they are not fools, because once they understand the value of any seed being tried successfully by a neighbour they will go in for it. More demonstration is wanted.

Assam cultivators are not used to grow fodder for the cattle. The utility of Guinea grass and broom corn needs more demonstration on cultivators' fields.

(*iii*) The two rice farms at Karimganj and Titabar respectively distribute paddy seeds of improved varieties recommended by the department, viz., *latisail*, *Georgesail*, *murali* M $\frac{35}{40}$ (*aus*), *basmati* (fine *aus*), *birpak* (*asra*). Apart from these a few other varieties are also recommended. Except rice, the Government farms do not grow any other seed for distribution. Some 50,000 cuttings of improved sugarcane at Jorhat farm and about 500 maunds of improved Shillong potato seeds are grown at the Upper Shillong farm every year for distribution. The great demand for good seed is supplied by buying seeds from outside and local growers. There should be Government seed farms in all the staple crops so as to distribute improved varieties of seeds.

(iv) Free license fo guns should be allowed to bona fide cultivators in the areas which are affected by wild animals of which the wild boars and elephants cause considerable damage.

Co-operative fencing is efficient in such a case. There is one such fencing by the railway line in Sylhet.

(*b*) The recommended farm varieties of paddy always give 1 to 2 maunds more yield per *bigha* (about one-third of an acre) in cultivators' plots than the corresponding local varieties.

(*c*) Efforts are being made to improve the following crops:—

(1) *Rice.*—(*a*) Pure line selection (continued for the last twelve years at Karimganj farm).
(*b*) Cross-breeding—F generation.

(2) *Mustard.*—Pure line selection (continued for the last one year).
(3) *Cotton.*—Varietal test (continued for the last three years).
(4) *Sugarcane.*—Varietal test (continued since 1908).
(5) *Potato.*—(*a*) Varietal test (continued since 1900).
(*b*) Selection (continued for the last four years).

QUESTION 12.—CULTIVATION.—Improvement on the following lines:—

(*i*) (1) Deep *versus* shallow ploughing.

(2) Preparation of land in winter right after harvest by improved machinery and if possible by motor power so as to grow two crops.

(3) Green manuring in winter.

(*ii*) The following rotation crops are useful in Assam proper of which the former is recommended by the Department:—

Nature of seeds.	First year.	Second year.	Third year.	Fourth year.
Average higher levels for sugarcanes.	Plant cane.	Ratoon cane.	*Dhaincha* or cowpea.	*Aus*, potato, peas and oats, mustard, *matikalai* or *arhar*.
Average lower levels for paddy.	*Dhaincha* or potato.	*Dhaincha* or cowpea, *sail* ground-nut.	*Matikalai* or *khesari*, *sail*.	*Aus* orjute, tobacco.

QUESTION 13.—CROP PROTECTION, INTERNAL AND EXTERNAL.—(*i*) The existing measures in Assam for protection of crops from insect pests and diseases are very poor. There is only one Entomological Assistant in the Province. If proper staff is appointed, work may be carried on to save the crops from cut-worm troubles in Karki-Katura, Sylhet, borers in fruit trees, betels and caterpillars in vegetables, etc. Work on the betel leaf and areca palm diseases is worth undertaking.

(*ii*) Had there been a Mycological Assistant in the Province, work could be carried on in controlling the *phytopthora* in potatoes, finding out some resistive varieties of potatoes successfully in Khasi and Jaintia Hills.

QUESTION 14.—IMPLEMENTS.—(*a*) Introduction of improved machinery is urgently required. The department should have an officer to propagate this. If properly handled, many useful and efficient implements, such as ploughs, harrows, etc., can be made by the country blacksmiths provided they are encouraged to do so.

(*b*) The cultivators will be willing to take up an improved implement if it is cheaper in price, so that he can afford to buy it. Moreover, it must be easily workable in his field and give a good service. Attempt should be made to make the implements locally. The department should have a workshop for the purpose.

The Government also should demonstrate the feasibility of improved machinery and make the people understand the need and efficiency of the same on economic basis. For this purpose, the department should have a set of different implements and a motor tractor with accessories. Assam has really a demand for improved implements and power cultivation.

(*c*) Manufacturers of improved implements being not quite aware of the necessities of the common cultivators cannot possibly make the implements suited to the need of the cultivators. The manufacturers must stay in the Province, study the problems and then make such implements as need be.

QUESTION 15.—VETERINARY.—(*a*) There is no reason why the Veterinary Department should remain separate from Agriculture. The amalgamation of the two will be an economic organisation on co-operative basis.

In Assam, the amalgamation of the Agricultural Department with the Co-operative and Industries has been a great stumbling block to agricultural progress. If Assam wants ever to develop the agricultural activities, there must be a separate Agricultural Department with Veterinary included in it under an expert Director.

(*g*) (*ii*) There should be at least a provincial veterinary laboratory in Assam, and if need be, this laboratory may be established near the present agricultural laboratory at Jorhat.

QUESTION 16.—ANIMAL HUSBANDRY.—(*a*) (*i*) There should be a breeding station in the Province to improve the draught animal as well as milch cows. Assam is perhaps the poorest in livestock in India. But there are some strains of indigenous cattle which could be well improved by cross-breeding them with other well-known breeds from outside. This has already been proved by the Taylor breed cattle at Shillong. The would-be cattle-breeding station at Khanapara will answer the purpose.

The Local Boards, Municipalities and Union Boards should be asked to maintain bulls.

Law should be enforced to castrate the stray bulls and weed them out by prompt action.

(*ii*) There is an urgent necessity for the improvement of the dairy industry. It may be improved by—

(1) Establishment of a model dairy in the Province.
(2) Establishment of co-operative dairy farms in district head-quarters where the demand is so keenly felt under the patronage of the Co-operative Department.
(3) Establishment of dairy farms by private individuals to take up dairy industry as a profitable business with the help of Government loans, if required.

(*iii*) It is the foreigners, the Nepalese, who are keeping up the dairy industry in Assam. So the existing practice can hardly be improved. Assamese should be encouraged to take up dairying.

(*b*) (*i*) Yes. Grazing areas are decreasing rapidly.
(*ii*) Yes. The Assamese do not have any enclosed pasture area.
(*iii*) The Assamese seldom attend the cattle at home.

They allow them to graze in the field freely. Although there is sufficient straw, they do not know how to save it and use it to advantage. They should be taught to do so.

(*iv*) Yes. The Assamese do not grow fodder for cattle. Guinea grass is recommended by the department.

(*c*) Scarcity of fodder is felt mostly in winter.
(*d*) Improving fodder supply by—

(*i*) More grazing area.
(*ii*) Growing of fodder crops.
(*iii*) Silo and silage.
(*iv*) Stocking straw properly.

(*e*) Landowners may be induced to take interest by—

(1) Sufficient propaganda to make them realise the need of good cattle and know how to tend them.

(2) Practical demonstration of growing fodder, siloing and feeding it to cattle properly.

(3) Supply of fodder crop seeds, cuttings or root-stocks free to *bona fide* cultivators for a time.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(*a*) In Assam proper, the cultivators grow one crop and so they do not work on an average more than four months in the field. In the slack season they do not do very much except hauling fuel wood to the market, repairing their houses and tending the cattle. As a majority of them are addicted to opium, they mostly pass an easy-going life. If this use of opium could be stopped, they could have a new start in life.

(*b*) Demonstration of the subsidiary industries and a systematic propaganda are necessary. The Industries Department ought to have a batch of Demonstrators to go round and talk to the people as they do in weaving and sericulture.

Government may aid in—

(1) Making by-products of rice and milk.
(2) Making *sathi* food (starch).
(3) Starch and alcohol from potatoes.
(4) By-products of fish, fruits and vegetables.
(5) Vinegar-making from cane juice and tamarind.
(6) Lump soap-making.
(7) Weaving by improved hand-looms.
(8) Umbrella handle-making.

(*c*) *Obstacles.*—(1) Majority of the cultivators are not acquainted with the industries named.

(2) Many people are prejudiced against such industries.

(3) Lack of sufficient propaganda by lectures and demonstration for which skilled workers are wanting in Government industrial staff, except weaving and sericulture. The latter are doing very good work.

(*d*) Yes. Except sugar-making, no attempt has been made in Assam to improve them.

(*f*) Yes. This will help in improving the rural areas.

(*g*) The following may help in better rural employment:—

(1) Selling chopped fodder in market.
(2) Making fishing nets.
(3) Broom-making.
(4) Lime kilns (in Sylhet and Khasi and Jaintia Hills).
(5) Making dolls and other playthings for children.
(6) Tinning and soldering.
(7) Nursery (selling budded and grafted plants).
(8) Truck gardening.
(9) Candle-making.

(*h*) The people should be taught by illustrated lectures about health and sanitation. The Public Health Department ought to have a batch of men to go round the villages. If such a lecture propaganda can be carried well, the people will realise the need and do accordingly to save themselves from diseases and death. In fact, they should be taught how "to make a living" instead of "getting a living." School teachers should talk to the boys about public health and sanitation.

QUESTION 18.—AGRICULTURAL LABOUR.—(*a*) (*i*) As there is a dearth of labour in Assam, there could be easy distribution, if the Assam-Bengal Railway would have been good enough to transport the working men from outside the Province at concession rates.

(*ii*) There are vast tracts of Government arable land lying idle in Assam. If the Government grant for homestead settlement is granted to outsiders, thousands of settlers can settle down in the swamp or grass land, lying on both sides of Assam-Bengal Railway from Gauhati to Dibrugarh, which will develop the country a great deal.

(*b*) As a majority of the Assamese have some land in their possession, they seldom want to go outside and work for others. It is only the foreign labourers, mostly ex-teagarden coolies, who work as labourers in Assam. The only solution would be to allow the labourers from Bengal to work as labourers.

(*c*) The Bengal labourers who are mostly from Mymensingh will settle down in swamp areas which are not occupied by the Assamese cultivators. They will serve the dual purpose of improving the swamp land as well as work as labourers in the field.

QUESTION 20.—MARKETING.—(*a*) No. Specific examples in Assam are the orange market at Chhatak, potato market at Shillong, cotton market at Goalpara and jute at Nowgong. Just at the time of harvest the market is being glutted by the produce and so it is sold at comparatively lower prices. Had there been an organisation of the cultivators for such a produce, they could control the market and get better prices.

(*b*) No.

Oranges in Khasi and Jaintia Hills are mostly sold to middlemen who sometimes pay in advance. The fruits are sold at Rs. 15 to 20 per 3,000 and taken down the hills in baskets to Tharna and a few other places, whence they are taken down to Chhatak in small country boats. Here the orange merchants come from various parts of Bengal. The oranges are sold to these merchants at about Rs. 30 to 35 per 3,000. The oranges are then carried down to Bengal markets by boats, except a few which are sent to Calcutta by train and steamer. These oranges are sold at 2 to 3 per pice at the Khasi and Jaintia Hills and are sold at half anna to one anna each in Calcutta.

Had there been an orange growers' association and the fruits could have been picked, packed and marketed systematically, cultivators could get four times the profit. Besides, the oranges could satisfactorily be boxed in pine-wood boxes which are found in plenty in Khasi Hills and be shipped to Calcutta. Unless the Khasi growers organise themselves, the industry will never thrive.

(*c*) Suggestions to improve the orange industry—

(1) Organisation of an orange growers' association in Khasi and Jaintia Hills.
(2) Hand-picking the fruits in bags by a ladder.
(3) Grading the fruits in a grader.

(4) Packing in standard boxes, 25 to 30 seers in weight.
(5) Sale to middlemen through the organisation at Chhatak and Sylhet, or ship in car loads, steamer or boat to distant markets in Bengal.

(*d*) With the organisation of each industry under an association, such information will be of great use. At present the only organisations that are benefited by it are the Tea Planters' and Jute Merchants' Associations.

QUESTION 22.—CO-OPERATION.—(*a*) (*i*) Government should employ more men in the staff to promote the cause of co-operation. The present staff is very limited.

(*b*) (*i*) Credit societies should be increased to help the cultivators living in remote corners of the country.

(*ix*) Social Service League in Sylhet which is not a Government effort.

(*d*) The co-operative credit societies have been doing satisfactory work in Assam.

QUESTION 23.—GENERAL EDUCATION.—(*a*) Yes.

(*i*) *College.*—There should be a separate agricultural college.

(*ii*) *Secondary school.*—Nature study training from class VII to X should be offered as an elective with opportunities to learn a vocation, such as poultry, market and nursery gardening, bee-keeping, in addition to general farming in the school farm.

(*iii*) *Primary school.*—Nature study training and school plots suit best from class I to VI. This course may preferably be compulsory so that the boys may have a knowledge about their own surroundings and may be induced to love nature. Besides, this will give them an idea to do some useful work, and make them realise the dignity of labour.

(*b*) (*i*) Nature study lessons with practicums outside the school room will make them more interested in agricultural work in addition to gaining knowledge in the general course offered in the school.

(*ii*) If financial problem is settled, it is by no means difficult to make primary education compulsory in rural areas. The main problem is that the school should be taken to the boys (and guardians) than the boys to the school.

(*iii*) After they get the rudiments of learning, the guardians do not find anything encouraging for their boys to attend the school any longer and so the number becomes smaller. Our school should teach something that can help the cultivators' sons directly. Introduction of nature study lessons will solve the problem.

QUESTION 24.—ATTRACTING CAPITAL.—(*a*) Steps to be taken are—
(1) Departmental activities should turn towards the cause of middle-class and capitalist farming. The educated should be taught to take up agriculture as business.
(2) Model farm should be started on profitable basis to demonstrate the feasibility of such enterprises.
(3) Introduction of power farming will reduce the labour difficulty, which dissuades many from starting such an industry.

(*b*) Discouraging factors—
(1) Owners of agricultural land remain satisfied with the little they have. They do not know anything better.
(2) Labour difficulty is very keen.
(3) Absentee ownership is a failure in many cases.
(4) No certainty of getting a satisfactory return of the investment.
(5) Lack of knowledge in growing a successful crop.

QUESTION 25.—WELFARE OF RURAL POPULATION.—(*a*) There should be an organisation like the Social Service League of Bengal. It should have its branch in remote villages and of the district. Itinerant lecturers and demonstrators should visit them from time to time and offer illustrated talks which should be both entertaining and instructive to all men, women and children. Government should patronise such an organisation.

Desha Bandhu Das's village reconstruction work is also an organisation on the same line.

The Ramkrishna Mission (*Sevasram*) is also another great philanthropic organisation to serve the cause of the common people.

The modern cultivator has some needs of his own, viz., social, economic, religious, educational and political. Attempt should be made to offer him help to attain them.

(*b*) So far as the present status of the villagers is concerned, any such economic survey will produce little or no result. We know the disease, but there is no remedy to offer.

QUESTION 26.—STATISTICS.—These are surely required in a Province that has advanced a great deal in its agricultural activities while for Assam, where the agricultural people are not yet organised, they will hardly be of any use.

Oral Evidence.

25813. *The Chairman:* Dr. Mitra, you are Economic Botanist to the Government of Assam?—Yes.

25814. You put in a note of evidence which you desire to give to the Commission? Do you wish to make any statement at this stage?—I just want to offer a plea on behalf of our department, that is, the Department of Agriculture. It is this; we want a separate department for ourselves. There should be a separate Department of Agriculture under an expert; if the finances of the Province do not permit that, we want at least that the Department of Agriculture should be amalgamated with the Veterinary Department.

25815. I should like to ask you first on the general question of research, whether you think there is that degree of co-ordination and touch between the Provinces that one would wish to see?—Yes; I do; and at present we are having occasionally some help from the Pusa Institute.

25816. And you are satisfied with the assistance that Pusa is giving?—No.

25817. You are not?—No; because they cannot help us in every way. We ought to have our own men to carry out the work. They may send us their men now and then but unless we have our own experts it is not possible to do anything here. Here I am the only expert in charge of Chemistry, Entomology and my own section, Botany. We have no Mycological Assistant in this Province. There is a good demand for all these experts.

25818. So that you think Pusa might devote its attention to problems of a fundamental and general character but that you must have in each Province a complete provincial organisation in order to apply the results of those enquiries to local conditions; is that your idea?—Yes; I may give the example of potato blight. We had the Imperial Mycologist here on several occasions. Even last year he came here and stayed for three days and planned out the work; but as we have no Mycological Assistant here, it is not possible for us to do anything.

25819. Would you tell the Commission about one or two of the principal problems of research on which you yourself are engaged at this moment?—At present my main work is rice-breeding; it is conducted at the Karimganj farm; we have also another farm at Titabar opened only two years ago.

25820. Rice-breeding is a general experiment. What particular problems are you engaged on?—Our main work here is selection work which is being conducted for the last twelve years on the Karimganj farm; but since 1921 when I was appointed, I began cross-breeding work.

25821. What particular qualities are you trying to evolve in your rice?—At present we are not looking for quality; we are only looking for quantity.

25822. What particular object have you in view in your crossing work?—We are trying to find out high-yielding varieties. We find difficulty in every way because the varieties which have been selected at the Karimganj farm are not always suitable to this valley.

25823. What other problems are you engaged on at the moment?—We have been trying experiments on the root system of rice, seed testing, transpiration, and the water requirements of rice; there are also other minor experiments that I have been continuing.

25824. You are doing some work on transpiration, are you?—I did, but unfortunately owing to lack of funds, I could not continue that.

25825. *Prof. Gangulee:* Have you published the result of that experiment?—I have up to date sent the result of the variations of yield of rice that we have been growing here; that was published in the *Indian Agricultural Journal.* There is another paper which is in print; that is on seed testing; I have already seen the proof. There is another note I sent on the sampling of rice.

25826. I am referring to your work on transpiration?—No, I could not be successful because I could not get enough money to get some of the appliances that I needed.

25827. *The Chairman:* Then I noticed in one report that has been placed before the Commission that a series of specific gravity tests has been carried out?—Yes, I continued that experiment for four years; up to date I have not been able to get any better result. I think this was also done in Burma, and they also, in their report I find, could not get any good results out of it.

25828. Do you attach particular importance to that problem in this Province?—Of course experiments in specific gravity as to wheat were successful in foreign countries, but here I have not been successful up to date, but I am still continuing.

25829. Are you familiar with the work being carried out on these particular problems that you have mentioned in the Presidencies of Bengal and Madras?—Not quite in Madras; I am well acquainted with the Bengal work.

25830. You are thoroughly familiar with the work being carried on in Bengal?—Yes, because before I came here this pure line selection work was planned out by Dr. Hector of Bengal, and I have been following the same principle with, of course, a little change here and there.

25831. How long ago was that work planned?—Before I came.

25832. How long have you been here?—About six years; I was appointed in February 1921.

25833. Has the time come, do you think, to do any fresh planning?—Yes, I think so. If we want to do something in research, we must have better appliances. Unfortunately, I am handicapped for want of funds and assistants so that I cannot do any effective research.

25834. Will you tell the Commission your own technical training?—I graduated in the University of California in 1915; I received my Master's degree in the same University; I then did two years' post-graduate work there. Later on I got a Research Fellowship at the Ohio State University in 1918. There I did post-graduate work for two years, and I had conferred upon me the degree of Doctor of Philosophy there from the Department of Botany. After that I worked for seven months in the Agricultural and Technical College, North Carolina, as Instructor of Science, when I was appointed to this post.

25835. Have you ever been to Pusa?—Yes, once, in 1922.

25836. Did you visit Pusa about some particular problem, or just to see the Institution?—I went there in connection with the Agricultural Board.

25837. Will you turn to page 89 of your note? Under the heading Horticulture, you say, "Orange is the most important fruit industry in Assam. Skilled workers to improve the cultural, manurial, handling and marketing problems are wanting." What do you mean by the handling problem?—I mean picking, packing and marketing.

25838. This Commission has already been told in evidence that there is no such thing as packing at this moment?—No.

25839. Is it your view that the price of the orange would carry the cost of packing?—The point is that through rough handling we are losing about 30 per cent of the produce before it reaches the market.

25840. You mean through the fruit being bruised?—Yes, and they are damaged by mould on their way.

25841. What is the method of picking in the Province?—Here in the villages they sometimes use a bamboo pole to strike the fruit down. In some places I have seen men picking with bags and a ladder; that, of course, is the best way, but it is not always practised.

25842. *Dr. Hyder:* Are the orange trees strong trees?—Of course orange trees are strong, but this hard handling bruises the fruit very badly and they are spoilt at once.

25843. *The Chairman:* On page 91 of your answer to our Question 2 on Agricultural Education, you say, "Adult education can be popularised by starting free night schools in villages." *On what do you found yourself* when you give us *that as your view?—Such experience as I have had in* Assam. In some places *private organisations have started night schools* in villages where the people hear illustrated lectures. At the same time in some of the towns, especially at Jorhat, night schools have been started by a private organisation. Men whose ages range from 16 to 40 attend; *they are eager to learn at least to sign their names.* I think that is one of the best means of educating adult people.

25844. Is that in the hills or the plains?—In the plains.

25845. In answer to our question on Finance you say, "The Government of India may start a campaign to raise money as agricultural loan, like the War loan". Do you distinguish between a loan raised like the War loan and a loan which is not a War loan. I do not quite see what you mean?—I mean to say this; the country is awake to the necessity; it is the demand of 90 per cent of the people in India, so that we might have a loan campaign by the Central Government just as we have had for the War. Then we could distribute the money so obtained all round the Provinces as need arose and thus help the farmers.

25846. That is a very picturesque way of financing the movement but it does not deal with the rate of interest, which is what I want to hear about. Do you suggest you could get money more cheaply in that way than you could through the ordinary channels?—I think everybody is awake to this, especially the educated classes, and I think there is every reason to think we should get help both at home and abroad; I am convinced of that.

25847. Are you carrying out any experimental work in connection with potatoes at the moment?—No, but in 1922, when I came here, I found that the most important problem we had to deal with was the storage of potatoes, so I started this storage experiment; but for want of an assistant I had to give it up. Another experiment I tried was to obtain a resistant variety by pure line selection of potatoes, but *I found that without any* help (as there is only one Farm Manager at Upper Shillong farm, he could not possibly help me very much) I am sorry to say I had to give that up too.

25848. Are you satisfied with the way potatoes are stored at Shillong farm now?—I am not.

25849. What is your ideal in the matter of storing potatoes?—I should be glad to distribute a smaller quantity of seed and try to get the seed from reliable sources, especially from the farmers whom we have supplied with our seed. We will get these seeds from a known source. At the same time, as blight is an important factor in relation to transport, I would suggest, and I have already suggested since 1921, treating the seed with copper sulphate, at least, before sending it out.

25850. What do you think ought to be the physical arrangements for storing potatoes?—In Shillong, underground storage would do very well.

25851. Do you mean pit storage?—Yes.

25852. Are you satisfied with the present storage in the shed?—The main requirements for storage are darkness, plenty of ventilation and a dry atmosphere; but those three requirements are not satisfied in the way in which we are keeping them at present.

25853. Would you fill up your trays to 4, 5, 6 inches or a foot? How much do you think would be safe?—If we keep them a foot deep, that does not make any difference provided we can get the right atmosphere.

25854. You do not mind their being stored a foot deep?—I do not think it will do any harm provided we get a proper place for storing them.

25855. Under the heading Implements you say on page 95, "Assam has really a demand for improved implements and power cultivation." What makes you think there is a demand for improved implements and power cultivation?—In this case I had in mind the middle-class cultivators. I believe that unless educated men take up agriculture as a business, it is not possible to improve agriculture in India.

25856. I am sure that is true, but I want to know who the cultivators are who demand improved implements and power cultivation at this moment?—At present we have some middle-class cultivators who are working with motor tractors, and they are looking forward to better implements.

25857. Where are their holdings situated?—They are mostly in Assam Valley, and there are some in the Surma Valley.

25858. Do you think there is an opening for the development of the fruit-growing industry in the hills?—Yes.

25859. Is there a tradition of fruit-growing among the hill tribes?—Yes; the native home of the orange is perhaps in the Khasi Hills.

25860. For instance, is anything known about root pruning; is that recognised at all?—They do not do any sort of pruning here at present.

25861. What does their tradition of horticulture consist of?—They clear a line on a slope, then grow seedlings and then drill the seedlings in. It is the natural flow of water from the upper side that gives them the crop. The rocks being calcareous, oranges grow well in the Khasi Hills.

25862. *Sir James MacKenna:* Apart from provincial work, do you consider there is room for a central organisation to assist the work of the Provinces either with men or with money?—I have said in my note that the Central Government might have a sub-station in every Province and send out men to tackle the problems which the Provincial Governments are not able to take up.

25863. What problems would you suggest for such a station in Assam?—I do not mean a large station; I mean a sub-station.

25864. Yes, a sub-station?—At present we have no Mycological Assistant. Assam needs a Mycological Assistant; if there were a sub-station, the Imperial Mycologist could come here and help us.

25865. You have your own Mycologist?—No.

25866. If you have this sub-station you will want a Mycologist of your own?—We are trying to get a Mycological Assistant for the Province.

25867. How would that central organisation assist your work?—Supposing we want to tackle a special quality of rice, for instance, the protein content, we do not know anything about the quality of our rice. I would like to have an Imperial Botanist to lead us in that.

25868. Do you think, apart from the central organisation, a conference at regular periods of workers on rice would be useful, say workers from Bengal, Assam, Madras and the Central Provinces?—Yes; that would help us undoubtedly.

25869. *Prof. Gangulee:* You said you were the only scientific officer in the department?—I am the only one who is tackling experiment and research; but the Deputy Director is also a scientific officer.

25870. You have two Botanical Assistants; what are their qualifications?—One of them is a graduate of the Sabour College. The other one read for three years in the Nagpur College, but unfortunately he could not appear for the examination and could not therefore get a certificate.

25871. Are you satisfied with their work?—Yes.

25872. They assist you in your breeding work?—Yes.

25873. They do not tackle problems independently?—No; they do not.

25874. What are the qualifications of the Chemical Assistant?—He is a graduate of Calcutta University, and he has been six years in the Tocklai farm.

25875. What problems is he tackling?—He is doing routine work, and he will test the juice of the sugarcane we grow. Apart from that we have asked him to make a soil survey of the Jorhat sub-division.

25876. At present he is analysing the juice content of the sugarcane?—Not at present. Sugarcane work will begin shortly.

25877. What work does he do at present?—He will begin sugarcane work shortly. He is now engaged on a soil survey in Jorhat. I am particularly interested in the acidity of the soils, because that is a problem which Mr. Meggitt handled when he was here. Two memoirs on that problem have been issued by the Agricultural Department.

25878. This Chemical Assistant is then carrying on the work commenced by Mr. Meggitt?—No. When Mr. Meggitt was here he had no assistant; he worked himself. This assistant was appointed in 1923 when I was in charge.

25879. I want to get from you what work the Chemical Assistant is actually doing now?—He is doing soil survey work and routine work, and he will shortly take up sugarcane work.

25880. He has already commenced soil survey work?—Yes; he has already commenced it.

25881. That is near about Jorhat?—In Jorhat sub-division.

25882. What are the duties of the Entomological Assistant?—His duty is to go round and train our staff in regard to remedies for diseases.

25883. Is he collecting any insects?—He has collected insects, and we have in our laboratory almost all the common insect pests of Assam.

25884. Does he study the life-history of any pests?—It is really a pity that he cannot take up any research work.

25885. *The Chairman:* Is it within your knowledge that coconut palms in the Province are being attacked by some pest?—Excuse me; it is the arecanut palm which is suffering badly in the Sylhet district. The coconut palms of this valley (Assam Valley) are attacked by a butterfly larva which does considerable damage.

25886. One witness who appeared before us was of the opinion that the department was not doing anything for the coconut palm?—Coconut is not an important problem here; it is important in Lower Bengal. The arecanut palm is important in Sylhet, and it is subject to bud-rot and root-rot. It is for this reason that the Imperial Mycologist came here in 1923. I also saw one of his assistants once during the last five years who studied the question of the arecanut palm disease.

25887. *Prof. Gangulee:* In the note you have given us you constantly speak of the soil being distinctly acid, but you do not give us any published data?—We have some. Recently we have published a little bulletin on acidity of soils.

25888. You have given there the pH. value of the different types of soils?—We have analysed a good number of them in regard to the pH. value.

25889. And the lime requirements?—We have published separate bulletins about lime requirements.

25890. Is this phenomenon of acidity important throughout the Province?—It is very important in the Assam Valley.

25891. Not in the Surma Valley?—In the Surma Valley all the rice fields are distinctly acid.

25892. You mention once or twice about failure of crops. Do you know whether the failure is sometimes due to acid?—We have tried an experiment at Jorhat and found it to be so, we tried *rabi* crops, and lime application gave us good results in all the *rabi* crops.

25893. So much for the chemical aspect of the work. What is your own work? You say your work is divided into two groups, pure line selection and cross-breeding. With regard to pure line selection you say you have two varieties of rice?—We have already given out five selected varieties.

25894. The two successful varieties of paddy are *lati sail* and *murali aus*?—These two were given out before I came in.

25895. Since you came in, you have given out three more varieties?—Since I came in, one, fine *aus* or *basmati*, and another *birpak* (*asra*). I have a few more selected varieties which are also going to be recommended.

25896. This *lati sail* is grown only in the Surma Valley?—Not only in the Surma Valley, but it is successful in Assam also.

25897. Have you compared *lati sail* with other rices?—I have collected rice not only from India but also from abroad.

25898. The result of pure line selection is that you have one variety of *lati sail* and one of *aus*?—We have *lati sail*, *George sail*, *murali* (*aus*), *basmati* (fine *aus*) and *birpak* (*asra*).

25899. The result of your six years' work is *basmati* (fine *aus*) and *birpak* (*asra*). With regard to cross-breeding at what stage are you now?—I am in the fifth year generation. I have got two varieties that have already been tried on the experimental farm; they will be distributed this year to other farms and also to demonstration plots for comparison.

25900. What are your crosses?—Between *George sail* and *lati sail*.

25901. Now, of the two lines of work, pure line selection and cross-breeding, which do you think is more promising?—In pure line selection we get early results, and that was why it was taken up. Cross-breeding is a long process. It takes about six years to get a real type.

25902. You are now at F_5. Will you get results in F_6?—We have selected two varieties from the fourth year (last year) and we have found they are superior to the rest; next year we will compare them on a field scale and also in demonstration plots.

25903. What are the indications of the prospects of F_5? Do you find any definite improvement?—There is a definite improvement in yield.

25904. You are undoubtedly familiar with the work of cross-breeding elsewhere. Has any marked improvement been effected by cross-breeding in any part of India?—From Madras they have given out two; from Dacca they have given out one; I am not sure whether they have given out a second.

25905. You are definite that these are the results of cross-breeding?—Yes.

25906. Have they done anything in Burma?—I do not think I have noticed any.

25907. You said that Dr. Hector planned the work?—Yes, pure line selection work.

25908. Not cross-breeding work?—No.

25909. Cross-breeding was started by you?—Yes.

25910. Have you consulted Dr. Hector?—I have been to Dacca six times since I came here.

25911. You are in touch with him?—I am.

25912. You are not familiar with the Madras work?—I am familiar with Dr. Parnell's work, but I have had no correspondence with him.

25913. You are familiar with the literature on the work that has been carried out?—Yes.

25914. With regard to the researches that can be taken up, you are suggesting by-products of oranges. What are they?—There is a large quantity of oranges that is wasted now. If this can be taken up both on a cottage industry scale and on a commercial scale, then I think there will be a good deal of improvement.

25915. Do you take part in propaganda or demonstration work?—I do whenever I get any chances, especially in agricultural shows, and in delivering lectures.

25916. You say here "Cultivators must be given to understand that no extra tax will be levied by growing a better crop through the advice of the experts." What do you really mean by that? Are the cultivators afraid of any extra tax?—When our Inspectors and Demonstrators go to any place and ask the cultivators to take our seeds, they have some suspicion about it. They feel that if they take up the new seeds which we are distributing and grow better crops, the rents might be increased.

25917. You also say here "Demonstration will be much more effective if some *bona fide* cultivators are supplied with seeds and commercial fertilisers free of cost or at least at concession rates. They will then have an incentive to use them to advantage." Are you aware of the fact that experience gained in other Provinces in India tends to prove that improved strains of seeds given free of cost to the cultivators are not appreciated?—I think, in our case, if it is given free to the cultivators, they will take it up.

25918. You think so?—I think so.

25919. Have you made an effort in that direction?—Nothing has been done in that direction.

25920. You have no experience to go by?—No.

25921. Have you developed any system of crop rotation either for the Surma Valley or for the Assam Valley?—In the Surma Valley, we have not done anything, but in the Assam Valley, we have a system of rotation that we have found to be very useful in sugarcane cultivation; I have mentioned it in my note, and I have suggested that that is for the average highland tract. For the average lowland tract, where rice is grown there may be some sort of rotation, but we have not been able to do anything on that line yet.

25922. Are the cultivators taking to your system of rotation?—I am not aware how far they have taken it up; in the Surma Valley, the people have some sort of rotation, because they grow two crops in many places.

25923. With regard to soils, you say, "At Jorhat, the experimental plots produced excellent sugarcane when they were under the supervision of the Chemist four years ago, while the same plots have now deteriorated and produce poor canes." Have you ascertained the causes of this deterioration?—It is a question of soil analysis and planning out the work properly.

25924. You have not enquired into the detailed process of the deterioration of the canes?—Of course, I know the processes in some places, but it was beyond my power to control them.

25925. I am not talking of controlling; have you determined the causes which led to this deterioration?—In some places the land was over-limed; in some places there was an over dose of phosphatic manure.

25926. You are definitely of that opinion?—I got it from the analysis of the Chemical Assistant.

25927. You say, "The people of Sibsagar, which is known to be a well-known productive rice-growing district, applied to the Settlement Officer, Sibsagar, a year ago to reduce their tax because they cannot produce good crops nowadays as they did a score of years ago." That shows that the deterioration goes on; have you ascertained the causes of that?—I received this information from the Settlement Officer; he wrote to me about the causes of it, but we have not been able to take it up at all.

25928. What are the causes of the deterioration throughout the Province?—To my mind, it is the continuation of one crop without the application of any extra manures or fertilisers.

25929. You say that there are vast tracts of swamp land in Assam; have you any suggestion how they could be utilised?—They could be plotted out and given to the cultivators free; Government might undertake reclamation work and have an officer to deal with that.

25930. On the question of the welfare of the rural population, you say, "There should be an organisation like the Social Service League of Bengal." Are you familiar with the Social Service League of Bengal?—I am partly familiar with the Bengal Social Service League, but I am familiar with the Social Service work in Sylhet; that work has been started since I came.

25931. Do you know if they are working in village areas or in urban areas?—They are working even in the villages.

25932. Is the work done intensively?—As far as their finances allow them to do it.

25933. *Mr. Calvert:* Are you doing any work on grasses?—No.

25934. Do you not think that there is great scope in Assam for rural pastures?—I do.

25935. What is the obstacle in the way of taking up this question of pastures in Assam?—Of course, it leads to something beyond my jurisdiction. I have not done anything on that line, but I have given a few suggestions in my note. As to the control of the pasture land, I have nothing to suggest.

25936. Is there no scope for making better cultivated pastures as in England?—I wish the people would realise the necessity of it, but they do not do anything here; if our work is organised, we can encourage the people to have regular pasturage.

25937. But is not the selection of good grasses in your own sphere?—That is perfectly true, but if we can make them grow fodder crops, that would settle the question.

25938. You suggest that Government should assist in the problem of extracting alcohol from potatoes; is that suggestion based on any experience?—There is a large amount of surplus potatoes in the Khasi Hills this year, about 50,000 maunds, which are selling at a very low price. As my Director has mentioned, they are sold at Rs. 1-8-0 per maund, and this is a sheer loss to the people; it does not repay them even half of the cost that they have already incurred. I think if there were any possibility of starting some work on that line, the industry would develop.

25939. Do you think alcohol could be produced at a price which would compete with other fuels?—This alcohol will not be used for fuel at all; we have no other source of alcohol here; we cannot produce any alcohol in this part of the country, and this could be made into methylated spirit very easily.

25940. Would there be any demand for methylated spirit?—There is great demand for it; it costs as much as 12 annas a bottle.

25941. It can be used as fuel?—It can be used in drug stores, for lamps, stoves and other things.

25942. That is for burning; could it compete in price with other sources of fuel, such as ordinary kerosene oil?—I think the demand for alcohol is quite different from the demand for kerosene oil. As for the question that you ask me concerning comparative prices, I can say nothing about it because we have never tried it.

25943. Is it a question of using potato alcohol in place of petrol for motor cars?—I had no idea of that.

25944. *Mr. Kamat:* We are told that the revenues of this Province could not afford a separate Department of Agriculture. I want to know whether you have gone further into this question, just to prove that the Province can afford it?—I have taken it up; as I have already stated, I do not want a complete separation if our finances do not permit it, but I want an amalgamation of the Agricultural and Veterinary Departments. I think you know that our Veterinary Department is separate, and Agriculture is amalgamated with Industries and the Co-operative Department. My suggestion is that the Agriculture and Veterinary Departments should be amalgamated together, and Co-operation and Industries may be a separate department by itself; in that case Government will not have to spend a single pie extra.

25945. That is a separate question altogether; you wanted to have a separate Department of Agriculture?—If possible.

25946. That is your first choice?—Yes.

25947. Now, you say that if the Department of Agriculture and Veterinary Department are combined together and the Co-opertaive and Industries Departments are amalgamated, there will not be any extra cost to Government?—Yes, there will be no extra cost to Government, because there will be only two Heads of Departments as at present.

25948. I do not quite follow why there will be no extra cost to Government under your arrangement?—At present there are two Heads; one is the Veterinary Adviser, and the other is the Director of Agriculture, Industries and Co-operation. According to my suggestion, the Veterinary and Agricultural Departments should be under one Head, and Industries and Co-operation should be under another Head.

25949. You have not explained what I wanted; do you mean to say that the Director of Agriculture should be a veterinary officer, to man the two posts on one salary?—He may have some allowance for it.

25950. You have at present a Director of Agriculture who is a non-scientific man?—Yes.

25951. And your suggestion is that the Veterinary Advisership and the Directorship of Agriculture should be one combined post, the incumbent drawing one consolidated salary?—Yes.

25952. It naturally follows that the Director of Agriculture must have knowledge of veterinary subjects?—It is an allied subject.

25953. Your arrangement, therefore, involves a man who combines a knowledge of agriculture and veterinary science?—It is not quite necessary. Under the present arrangements, the Director of Industries who is also the Director of Agriculture is not even an expert in agriculture, but in the

other case, when the Agricultural and Veterinary Departments are combined, an expert agricultural officer will have at least some knowledge of veterinary science.

25954. So, that is a pre-requisite to make your arrangement workable; otherwise it is not possible?—It may not be a pre-requisite, but it is understood that the agricultural officer knows at least something about cattle.

25955. Do you think knowing something about cattle would be quite enough to run a Veterinary Department?—Of course, he may not be an expert, but the combination would work better in our case.

25956. I do not think you quite follow. What is necessary is that the Veterinary Department must have a man who knows the science of veterinary subjects?—Quite so.

25957. And if you want to save expenditure by combining the two posts in one man, that one officer must be both a scientific expert in veterinary subjects and a scientific expert in agriculture; otherwise, your scheme does not succeed?—In our case, if the Veterinary Department is combined with the Agricultural Department, there must be a Deputy Director for the veterinary side, who will be able to advise the Director in every way.

25958. Does it not increase the cost?—There is sanction already for a Deputy Director for the Veterinary Department.

I do not think you have been able to prove that, within the amount you are now likely to get from the revenues, you could re-adjust the existing arrangements.

25959. With reference to your suggestion to have an Orange Growers' Association, you say that if there is such an association the orange growers will get four times the profit; is that correct?—Yes.

25960. Have you attempted to form an Orange Growers' Association?—No.

25961. Which department should take the initiative in your opinion?—In this case it should come either from the Agricultural Department or the Co-operative Department.

25962. But both these departments are combined in one in this Province to-day?—Yes.

25963. Then why has not initiative been taken?—Nothing has been done; that is all I can say.

25964. Then about subsidiary industries; I think there are industries which your department itself can initiate. Take, for instance, the industry of vinegar-making; what has prevented your department from taking it up?—These are cottage industries and, at least in Assam, they come under the Industries Department.

25965. Here, again, the Director of Industries is the Director of Agriculture also?—That is true; but vinegar-making really comes under the Agricultural Department. Here in Assam it has not been taken up by the Department of Agriculture.

25966. I want to know why you have not demonstrated on a small scale that vinegar could be made?—We have not got the money to work on these lines.

25967. So in this case it is not a question of men; is it money?—I think both.

25968. You state that departmental activities should turn towards the cause of middle-class and capitalist farming and that educated people should be taught to take up agriculture as business. In order to attract the middle-class educated men, agriculture must pay. Are you quite sure that agriculture as a business pays in every case?—If it is properly done, it will pay.

25969. If that is the case, then have you taken any definite steps to attract capitalists as has been done in other countries. For instance, in South Africa people are advertising for private capitalists?—Nothing has been done but there is scope here. We have abundant areas in Assam where such capitalist farming can very well develop.

25970. It is not a question of area. I know you have got millions of acres which are practically waste land, but the question is whether it pays

as a business proposition. Supposing a man starts with a capital of Rs. 2,000 and asks for some proper land, how much can he earn per year?—I have no idea.

25971. If you have not done that, how is capital to be attracted into your Province?—We have got past experiences to rely upon.

25972. Those are very vague experiences?—There are two farms in the Kamrup district which are being run by two gentlemen farmers. They are using tractors and both of them are successful.

25973. I do not want generalisation from extreme cases of men who are using tractors; I want an average case. Have you been able to prove that if an ordinary man with small capital takes, say, 10 acres of land, he can make a decent living on an average of five years?—It has not yet been proved in Assam.

25974. Then you are stating that capital could be attracted and educated men brought in on data which have not been proved to be successful?—We find it among the few and we are hoping for its extension.

25975. What I have been trying to make out is this, that the department has not, either in the matter of subsidiary industries or in the matter of attracting capital, taken any real initiative, either by giving to the world proved data or by taking steps to demonstrate industries like vinegar-making, in showing that there is a great deal of scope for going ahead?—I agree with that.

25976. *Rai Bahadur R. M. Das:* Are you carrying on any experiments in deep water paddy or *boro* paddy?—No.

25977. Do you not consider that these two crops are very important for the Surma Valley?—They are very important in some places.

25978. Then why are you not taking them up?—We have not got funds to start suitable farms to carry on that sort of work.

25979. You told us something about the social service work. Do you know that the Sylhet Social Service League is working among the rural population in the district?—Yes; I know the men who have been working it. Of course, it was started only since I came here and we have worked together in some places at agricultural shows.

25980. Did you present some agricultural slides to this League?—I did; they were my own slides that I brought from the States.

25981. Do you know that these lectures are very much appreciated and are very popular among the cultivators?—I have found all round Assam that wherever I have lectured the cultivators have appreciated these things.

25982. Do you think that, if your department organises such lectures for the diffusion of agricultural and veterinary knowledge, it will go a great way in solving the problem of agricultural education?—I agree with you that this propaganda work will help a great deal.

25983. Do you know that the Sylhet Social Service League has started some night schools?—I have heard about it. I have never visited those schools.

25984. Are not those schools very much appreciated? Do not pupils varying in age from 16 to 40 attend them?—I have heard that people attend these schools.

25985. Do you think that if similar schools are aided by Government and if the Sylhet Social Service League is also helped by Government, they will be able to do a lot for the welfare of the rural population?—Yes.

25986. *Sir Henry Lawrence:* Is it the case that the paddy growers in this Province require a very large number of varieties of paddy seeds to suit the conditions of their fields?—They do not need it, but unfortunately, they cannot avoid it. They do not need so many different varieties.

25987. You think they can carry on with one or two varieties?—If they do, they will get a better market for their crop. By having so many different varieties they are just mixing up their crops and they cannot keep them pure. Whenever we recommend them our varieties, we always ask them to keep them pure so that they may have a uniform produce.

25988. What are the results obtained on the experimental farms in the Bombay Presidency regarding rice?—I am sorry I do not remember them now.

25989. In Madras also they have a considerable number of varieties in their farms which they distribute to different areas in accordance with their conditions; you do not agree with that policy?—I do agree with that policy; but as I have already said in answer to a question by the Chairman, we have not yet tried our recommended varieties according to the different soils that we have in both the valleys.

25990. I suppose fundamentally your problems are similar to those in the Madras and Bombay Presidencies?—They are. I had a talk with Dr. Burns, the Economic Botanist of Bombay, and I found that their work is just the same as we have been doing, namely, selection and cross-breeding.

25991. Then you are keeping yourself acquainted with the work in other Provinces?—So far as literature is concerned, yes.

25992. In answer to our Question 3, I do not understand your point about the fear of cultivators that they would have an extra tax if they grew a better crop. Is the assessment here not fixed for a number of years?—I am not in a position to answer the latter question, but as regards the former, I can say that the cultivators are illiterate people and as soon as they see an Inspector of Agriculture or a Demonstrator approaching them with these good seeds, they become afraid that if they grow a good crop their rents may be increased.

25993. You mean to say that their rents will be increased by the zamindar or by whom?—Their rents will be increased by the Government. In this Valley, there are no zamindars.

25994. I want to be quite clear on this point. Are you talking of the rents payable to the zamindar or the tax payable to Government?—I am talking of the tax payable to Government, especially in the Assam Valley, because there are no zamindars here except in Goalpara.

25995. Are the landholders here exempt from any increase of tax due to their own improvements?—I cannot tell you anything about it.

Mr. Hezlett: It is the general policy of Government not to tax the improvements of cultivators.

25996. *Sir Henry Lawrence:* Is it laid down by law?

Mr. Hezlett: I do not know; Mr. Scott will be coming before us to-morrow and he will be able to say.

25997. *Sir Henry Lawrence:* On page 97 of your note regarding agricultural labour, you say that the only solution will be to allow the labourers from Bengal to work as labourers. Would you explain that point further?—What I meant to say was that here in Assam there is a dearth of labour and if there is scope for these Bengali labourers from Mymensingh to come to Assam, that will partly solve the question.

25998. Who is it that prevents the labourers from Bengal from working as labourers in Assam; is it the Government?—It is not the Government but they seldom can find a chance to come here as it is a long way off. There must be some one to take the initiative and bring them in.

25999. Do I understand your proposal to be that Government should organise some means of obtaining Bengali labourers?—I do not go so far as that. What I meant to say was that if there be any place in the Province where there is a dearth of labour, this fact may be announced to the neighbouring Province from where we can get such labour.

26000. In regard to fruit cultivation, I understand generally from your note that the main obstacle is the lack of roads and transport; is that so?—That is one of the main obstacles.

26000-a. Do you advocate that fruit areas should be improved in the matter of communications?—Yes.

26000-b. *Sir Thomas Middleton:* In your note on Agricultural Education, you say on page 90, "Except college education a separate agricultural school for the training of the boys of agriculturists will seldom be a success"; and on the next page you think that agriculture should be added to the curriculum of high schools. I am not clear as to your policy for agricultural education?—What I mean to say is that a separate agricultural school will not be favoured here. If I remember aright, a separate agricultural school in Bombay was also not favoured. As regards your next question regarding the introduction of agricultural courses, that can be done

in a different way. If our University authorities have agriculture in their curriculum, then there can be combination in our high school courses as it is done at present.

26001. Were you a graduate before you went to California?—No.

26002. What stage had you reached when you went to California?—I had studied up to the First Arts.

26003. Do you think that the ordinary student, or even the first rate student, knows enough English to enable him to prepare himself in science subjects and also to take agriculture in his high school course?—We are doing that at present but it is really difficult; I have undergone this difficulty myself and I can quite understand that if we had a course in high school agriculture, high school physics and high school chemistry, it would facilitate the work of the college. These boys when they get through the high school and enter the college can follow the courses very easily and at the same time the teachers also will be relieved of a good deal of work.

26004. Would you agree that the teaching must be of a very high standard in the high school?—No; just elementary agriculture in the high school just as we find in foreign countries, in the United States for instance.

26005. But as judged by our standards, the class of instruction given in the high schools in the United States would be reckoned as high-grade instruction, would it not?—I admit that they have other facilities. For instance, they get instruction in their own language. In our case especially the middle-class boys seldom know anything about their surroundings; they do not know that what they eat is coming from the poor peasants; they do not realise that at all.

26006. I fear that adding agriculture to the courses in the high school would overload the already overloaded curriculum?—I do not think so, because at present in the high school in the four years—from Class VII to Class X—we have a combination of mathematics, Sanskrit and English, for example. One can go without history and geography; at the same time one can take history and geography and not Sanskrit. Thus there are many groups already and, if we add agriculture to them, it will not do any harm.

26007. You feel that if you had had an opportunity of studying agriculture at a high school, you would have gone to California better equipped?—Yes; I quite realise it.

26008. While you were studying for your doctorate were you engaged in plant-breeding work?—I did plant-breeding work in the University of California. I also specialised in horticulture and botany.

26009. While you were in California did you come across the fruit-growers' association there or hear of their work?—I have heard of their work. The biggest is the Orange Growers' Association in Los Angelos.

26010. How do they pack oranges?—They pack them in boxes as they collect them; these boxes are specially made.

26011. Do you know what timber they are made of?—They are made of pine.

26012. The same pine as is growing here?—Yes; that is why I advocate that system here.

26013. Do you keep in touch with the progress being made by the American experimental stations since the War?—Not very much at present.

26014. Do you know that they have largely extended their county work in recent years?—They have got one Agricultural Adviser in each county; he is the man who is responsible for propaganda and demonstration.

26015. Who corresponds to that person in this country?—I cannot compare him in that way because he is a graduate of the College of Agriculture.

26016. But his work is to do the work of your Demonstrator?—Quite so.

26017. And he is a graduate before he comes out as a Demonstrator?—Yes.

26018. If he is a specialist, where does he come from?—These specialists in the States come from agricultural colleges. They are quite separate from the specialists who are in the provincial stations maintained by the United States Department of Agriculture.

26019. Who directs the work of the County Agents in the States?—The Director of Agriculture is at the head; but there is an organisation in every State over and above the propaganda work.

26020. What has been the training of the Director of Agriculture as a rule?—They are all graduates; that is all I can say; but some of them might have more than one degree.

26021. Some are specialists and some are men of the county type?—I think all of them are specialists at present.

26022. Coming to Assam, you are conducting a soil survey in your district? Do you know the work of the American soil surveyors?—I am not a chemist; but what I find is we really want a survey of our soils before we can safely recommend different crops according to the nature of the soil.

26023. Do you know that the soil surveyors employed in America are not all chemists?—They are all chemists; at the same time there are some soil physicists also who might not be chemists.

26024. These are the specialists; but the man who conducts the field survey is trained as a geologist?—I do not know that.

26025. You are troubled a great deal with acidity in the soils of Assam?—That is what I find from my chemical work.

26026. Do you know that the field surveyor in America carries with him a very simple outfit?—Yes; I have got a soil testing apparatus; I got it six months ago.

26027. What is the p.h. value of your soils in Assam, roughly, is it 4, 5 or 6?—It runs up to 8, that is, neutral on this side and on the other side it goes down. We are trying the Hopkins' method, too.

26028. I only want to get some idea of the degree of acidity of the soils described as acid; is it as low as 5?—Perhaps below that too.

26029. Coming to this question of your studies on rice, you have indicated somewhere that you think that the soils are too acid for rice. Have you done any experimental work?—I have not indicated anywhere that it is too acid for rice; but I say it is too acid for *rabi* crops.

26030. Have you studied the soil conditions under which rice can thrive?—Rice can thrive in any place; acidity of the soil has nothing to do with it. But I have found it in laboratory experiments in the Erlenmyer flasks that it can bear alkalinity but not acidity.

26031. *Prof. Gangulee* : You said just now that acidity has nothing to do with the growth of rice?—In our experiments in the Erlenmyer flasks it could bear alkalinity but nothing of acidity. Even .2 per cent of acidity is injurious to the seedling while it can stand more alkalinity. Of course in that case my acidity was mineral acidity.

26032. *Sir Thomas Middleton :* But you cannot tell me what the relation between the acidity of the soil and the growth of rice is?—We have not tried that. Acidity does not affect the rice as the rice soils are distinctly acid, even to litmus.

26033. You say you want to study the question of environmental influence upon the quality of rice; and I think you refer specially to the percentage of protein?—That is the main idea.

26034. Have you any information as to the variation of the protein in rice at all?—I have none; I had no one to analyse the rice samples that I had.

26035. In answer to Professor Gangulee, you said that you have got now rice in the fifth generation. You are testing it for yield. Is the fifth generation fully fixed?—No; some of them were not pure. We had fifty of them here and only two of them came out prominently.

26036. When you say not pure, what would be the percentage of the impurity in the fifth generation?—It varies a good deal in different crosses. I have not been dealing with one only. I have crosses going on for the last five years; and every year some new crosses are being added.

26037. If you have much impurity in the fifth generation, you have a good deal of work ahead?—Yes. There are some which we do not use. Some are impure and we try to find out whether we can get any better strain in that impurity.

26038. With regard to potatoes you mention the fact that the Imperial Mycologist has visited your place and given you advice on potato blight. What is wanted in the study of potato blight here?—The only thing that is wanted is spraying; but we have not studied the nature of the attack in this place.

26039. Is it any different from the nature of the attack in every other country?—There might not be any difference but the place where we could attack this problem has not been found out here. As soon as we find the spots on the leaf, we begin to spray but that does not control all of them. If we can find out when and how to attack the problem, then of course we can do something.

26040. Could not the Mycologist tell you that? Is it not a case of trying spraying at different times with varying frequency and at different strengths?—Not only that, but even in storage.

26041. We will come to storage later on; we are now talking of the growing plant?—The actual time we know. The Imperial Mycologist will give us the time to do it; but I think if we have a Mycological Assistant of our own, he can go round and see what will be the best time to spray and so on. I wish we could have a Mycologist to work with us.

26042. On the question of storage, your potatoes rot because they have been blighted; that is the difficulty?—That is the main difficulty.

26043. You have expressed the view that it would not matter if you stored them a foot deep?—As the climate in Shillong is very cold, I do not think the depth would have much effect.

26044. Have you not seen that the potatoes stored in boxes at the Shillong farm are even now beginning to form long shoots?—They are sprouting because they are in the light.

26045. No, excuse me, it is because they are in the dark that they are sprouting so much?—Of course, that is true too in one sense; but, although we have not made any experiments on this, I do not think they would have sprouted so much had we been able to keep them in a uniform temperature and at the same time in darkness.

26046. I can tell you that if you expose them to the light it will stop the sprouting?—We have not done any work on that line yet.

26047. You suggest using copper sulphate for sprinkling the seed?—Copper sulphate and lime; Bordeaux mixture I mean.

26048. I thought you said copper sulphate?—Excuse me, I suppose I omitted the other.

26049. You talk of a pure line of potatoes; I do not know what a pure line of potatoes means?—When we get new potatoes from abroad many of them are mixed. At the same time, when we bring them here it is not possible for us to keep them pure, some of them are so badly mixed; if we can keep them pure it will serve us better.

26050. You may use the expression 'pure line' in connection with rice selection; but not in connection with your potato-growing?—That is quite true, but what I meant was just to keep them pure.

26051. You mean you want to rogue your potatoes?—That is the main thing that it is necessary for us to do.

26052. *Prof. Gangulee:* Are you familiar with the potato investigations carried in Rothamsted in England?—No, I am not.

26053. *Sir Thomas Middleton:* Can you tell me anything about the potash requirements of potatoes; have you studied that?—It is a potash-loving plant.

26054. Looking through your list of experiments with manures I found no reference to any potash experiments?—The water-hyacinth ash was experimented with in Surma Valley on potatoes and it was successful to a certain extent; but may I tell you frankly I do not deal with this potato crop at all because that is under the Deputy Director.

26055. Yesterday I was informed that a Mycologist was wanted to study areca palm diseases, but I think you referred to-day to the fact that the coconut palm was affected by an insect?—That is not coconut palm, that is the areca palm.

26056. What are the diseases of the areca palm?—The fungus disease.

26057. Both are fungus diseases?—I am not sure about the root-rot of the areca palm, whether it is fungus or not.

26058. *Mr. Hezlett :* You think it is not a good thing to amalgamate the organisation of co-operative credit and agriculture. Most people seem to think it is a very good thing, especially in a small Province like this. There was some ill-feeling between the officers of the two departments before they were put under one Head. Now they are under one Head; do you not think the amalgamation is rather a good thing on the whole in the present circumstances of the Province?—I really cannot agree with you on that point. At present our Director has got these three departments and the work is very heavy; it is too much for him; but if agriculture and co-operation are combined, he might still be relieved of some of the work. If we are to see a real development of agricultural research and experiments, we require a Head well acquainted with those researches and experiments.

26059. It was suggested as a matter of fact three years ago that there should be a separate technical officer, but then times being bad, and Mr. Birt retiring on account of ill-health, the whole scheme fell through?—Yes.

26060. So that since then, in view of straitened finances and for other reasons, we have had to carry on as at present?—We need experts, we need a laboratory to carry on experiments and research. If we had an expert for those two departments, I think we should be better off than we should be with these three departments combined as they are to-day.

(The witness withdrew.)

Mr. DIJESH CHANDRA CHAKRAVARTY, M.A., B.L., Dewan, Gauripur Raj Estate, Assam.

Replies to the Questionnaire.

QUESTION 1—RESEARCH.—(*a*) (*i*) I think that provincial research organisations should be abolished and a central research institution for all-India, equipped with up-to-date laboratories and experts should be established under the supervision of the Government of India. All cases for research might be referred by provincial officers to the central institution and the result of such examinations communicated to the Provinces, who could work upon the advice given. Demonstrations should be made in Provinces based on those results.

Indigenous theories and traditional local methods represent the accumulated wisdom of generations and the existing practices should not be discarded without careful examination.

(*ii*) *Veterinary research.*—Local cattle are gradually deteriorating—both draught and milch cows. Cultivators largely depend upon imported draught cattle which they buy at large prices but they seldom keep well in this part of the country. Improvement of local cattle has not been seriously handled.

(*b*) As far as I am aware, there are no up-to-date laboratories for carrying on agricultural research or veterinary research in this Province and neither agriculture nor veterinary subjects have been seriously tackled.

I might mention the case of coconut trees. Since the last seven or eight years, a very large number of coconut trees have died. In several places, betel-nut trees have also been similarly affected. These trees are very lucrative in these parts and the local people derive a very large income from betel-nut trees and the attention of the Agricultural Department should have been directed to this to eradicate the blight.

(*c*) I would suggest that research might be made with a view to introduce new lucrative crops other than those which are usually grown by local men, e.g., linseed, *nigella indica (kalajira)*, *ajowan*, pepper and potato, *patol*, etc. The ryots from Bengal who are settling in these parts already grow many of them but unfortunately the local people do not take to these and I think they should be induced to adopt these special crops after it has been found by research and experiment which of these would grow well in these parts.

QUESTION 2—AGRICULTURAL EDUCATION.—There are no institutions for a comprehensive agricultural education in this Province. Pupils used to be trained in the Jorhat farm before but that also is being gradually discontinued, and the instruction given before was not in any sense full.

(*i*) No.

(*ii*) Everywhere, I should think. As for my district of Goalpara, the need of agricultural education is of the foremost importance. In my part of the district, ordinarily the conditions are complex as besides the normal soil of the district, there are *chur* areas and certain areas which sank during the earthquake of 1897 and are yet lying waste. The problems are different in these three areas which require separate consideration. This matter was brought to the notice of the Agricultural Department and although local enquiry was made for two days, I am not convinced that sufficient attention and care were given to the subject.

(*iii*) Yes, if there are qualified and willing men: but I would not confine this to agriculturists only.

(*iv*) If improvements are demonstrated in rural areas as the result of scientific methods in agriculture, the demand for instruction might be stimulated; service would be another attraction.

(*v*) If agriculture could be shown to be a lucrative vocation, young lads might seriously think of adopting it.

(*vi*) There are no institutions.

(*x*) See (*v*) above.

(*xii*) If agricultural education dealing with local crops, etc., and care of cattle, a little survey and accounts be included in the instruction to adults they are likely to take more interest than in the purely school curriculum. Special books should be written for their education. Efficient and tactful teachers are absolutely necessary for the education of adults. Popular religious books should also be added.

(*xiii*) (*a*) Agricultural education is of the most vital importance in a country like India and I think that Government has not given the amount of attention to the subject which its importance demands. The result has been that while other agricultural countries, such as Japan, are daily improving their agricultural methods thereby enriching their peasantry, Indian ryots are growing poorer and poorer. Agriculture must form an important branch in the course of instructions from the primary to the secondary schools leading to higher education with agricultural degrees.

To effect this, I would bring the Agricultural Department under the Education Department and in fact amalgamate the two. In the present Agricultural Department, the highest post is occupied by a Director who is not an expert on the subject. From the next post, viz., that of Deputy Director of Agriculture, all are experts with special education in the subject.

In all secondary schools, there should be agricultural teachers for instruction in those subjects, just as we have the science course men for mathematics, etc. From the middle English and middle vernacular schools to the primary schools, I would have the teachers specially trained in agriculture and put the duties of teachers and Agricultural Demonstrators on the same man thus doing away with the subordinate staff of the Agricultural Department. The inspecting staff of both the departments should be amalgamated and they should gradually be recruited from agricultural graduates. The existing school *pundits* could be trained in agriculture in the Normal Training School, where expert agricultural teachers should impart education to the *pundits*. In this way, the duplication of staff will be avoided as well as dual control over the same school. The demonstrator-*pundits* would carry on demonstrations in the localities as now, according to the directions of expert supervising officers.

It would, of course, be necessary to have special expert agricultural officers for research and practical experiments and for supervisions. They can also act under the Director of Public Instruction who would be the principal administrative head under the Governor and his Minister. The details, I think, could be satisfactorily worked out. I think under the present circumstances this would be a practicable scheme. One or two institutions for agricultural education alone would not meet the demand and the poor agriculturists will not be able to take advantage of such institutions. Such schools for higher agricultural education might be started,

but agriculture, I think, should form an important subject in the ordinary curriculum of instruction beginning from the primary schools attended with practical classes fitted to the ages of the students. These subjects should be compulsory up to say the third class of secondary schools after which this subject may not be taken up by those who intend to have general education on other subjects.

One great mischief which is resulting from the boys of the agricultural classes joining the ordinary schools is that as soon as they come in contact with the *bhadralog* boys, they begin to look upon agriculture as a degraded vocation. The *bhadralog* boys in their turn are used to look down upon agriculturists. If, however, both classes are taught agriculture from the primary schools and made to take part in practical methods of agriculture from the beginning, this mistaken view will disappear and both classes would learn to value the dignity of labour.

It may not be possible to have demonstration plots connected with town schools.

(*b*) If the Education and the Agricultural Departments were amalgamated, there would be considerable saving. It would be possible for the teachers to be better paid.

Finance.—It is difficult to say how Government could meet this expenditure, but I would press that Government should retrench in other departments to make liberal grants for agricultural research and education. I am not competent to suggest how this is to be done but it is certain that, for India, agriculture is a most important subject and improvement in this direction should not be retarded for want of funds. It is also true that nothing can be done unless there are adequate funds and so the necessary money should be found, even if extensive retrenchments have to be made in other subjects.

QUESTION 3—DEMONSTRATION AND PROPAGANDA.—(*a*) Demonstrations on the plots of lands belonging to intelligent and knowledgable cultivators in rural areas: but much more remains to be done.

(*b*) When a successful crop is harvested, the adjoining villagers should be brought to the spot and the result shown to them.

Prizes and recognition in other ways by Government and zamindars would also be appreciated.

(*c*) Expert advice must be backed by successful demonstration in plots in rural areas. Agriculturists are, as a rule, very conservative but if they are shown that there is a larger yield or a better class production by using improved seeds or new manures, resulting in larger profit, they will be quick to adopt such expert advice.

(*d*) I do not know if it would be pertinent to this question, but I can mention one instance which occurred two years ago, after a severe flood in some parts of this estate. I asked the Agricultural Department for a large quantity of paddy seeds for loan to tenants to enable them to try a new crop in places where the existing crops had been destroyed by floods. The seeds were supplied and paid for by this estate and distributed amongst the ryots. In many areas the seeds did not germinate but the Agricultural Department did not refund the price which had to be borne by this estate. The result is that the ryots lose confidence on seeds supplied by the Agricultural Department and it will now take years to restore the confidence thus lost. This is of course due to the department's having no seed stores.

QUESTION 4—ADMINISTRATION.—(*a*) For the purpose of economy and efficiency, I have stated at the outset that the research institution for agriculture should be under the direct control of the Government of India and I think provincial laboratories and staff might be altogether done away with.

(*c*) No.

(*i*) A beginning has only been made and much remains to be done.

(*ii*) There are very few railways and none in the east bank of the Brahmaputra in this district.

(*iii*) Roads are few and there are large tracts without a single road. This is a flood-ridden district and all trunk roads ought to be above flood level and bridges over waterways have to be constructed. At present, even important trunk roads are without bridges, and when roads are made,

sufficient waterways are not kept with the result that areas become water-logged or the roads are annually breached. I have seen jute selling at Rs. 2 per maund below current prices within two miles of markets, for want of roads.

(*iv*) As the Meteorological Department now claim to be able to give accurate forecasts about rainfall, etc., it would be a real benefit to agriculturists if these reports are communicated to rural areas. The reports should be widely circulated in vernaculars.

(*v*) There are very few post offices now. The Postal Department would not open a new post office unless the income meets their cost. This rule should be discontinued in case of experimental post offices.

(*vi*) In this estate there are only three telegraph offices and seven post offices in an area of 60 square miles.

QUESTION 5.—FINANCE.—(*a*) This is a most important thing without which any substantial progress is impossible. Besides private sources, the recognised sources of finance are from the co-operative credit societies and Government agricultural loans.

As for co-operative credit societies, these institutions would require time to thrive as their success and expansion would depend upon the spread of education. Then again the most influential and moneyed people in a village—on whom depend the success of these institutions—are generally antagonistic. These societies depend upon Central Banks for their capital and are supplied with very small amounts only which are utterly inadequate for clearing the indebtedness of the area. I am not hopeful that in the present system, the co-operative societies can finance agricultural operations, unless their capital is supplemented by Government loans at a nominal interest. In every area served by a co-operative society, there are several cases of big indebtedness which must be outside the scope of such societies as they would require loans for long periods. I would limit the operation of the co-operative societies to short-term small loans and the former classes should be taken up by Government agricultural loans. The law regulating these loans should be modified and the term of repayment fixed on the facts of each case.

If, however, co-operative societies are opened for the sale of the agricultural produce of their members—thus saving the middleman's profit on behalf of the growers—and a certain percentage of this increased profit be deposited in the societies in the accounts of the members, the capital in the societies might be very largely increased.

This and Government loans, either through the co-operative societies or under existing law, modified to suit the requirements of the borrowers, could be the only sources of finance to agriculturists which they could get at a reasonable interest.

Private capital is usually shy of all Government measures and the money-lenders generally lend on very high interest. Although it is difficult even by legislation to regulate the rates of interest, I think an attempt should be made to reduce the rates of interest by legislation. This might induce people to deposit their moneys in Central Banks when the latter are run on successful business lines and are able to pay reasonable dividends.

(*b*) I think people would readily obtain loans both under the Lands Improvement Loans Act (India Government Act XIX of 1883) and the Agricultural Loans Act (India Government Act XII of 1884) if they are given. The rules under those Acts may have to be modified but my impression, and I might add experience, are that loans under these Acts are not given by Government for want of funds.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(*a*) (*i*) (1) Improvidence.

(2) Litigation—in most cases village touts are responsible for this.

(3) Failure of crops.

The ryots have gradually lost the habit of work and now employ hired labour for operations they used to do themselves.

(*ii*) Village moneylenders, local *mahajans*, loan offices. From villagers they also borrow paddy whose rate of interest is from 100 to 150 per cent to be repaid in kind after a few months.

(*iii*) Expenditure higher than income to which may be added the heavy rate of interest, and hypothecation of crops at times of need.

(*b*) To increase the income of the ryots. Reduction of interest by legislation or facilitating redemption of mortgages by lending money either from land mortgage banks or under Agricultural Loans Act, may also give temporary relief.

An average poor ryot who has not enough paddy for the whole year's consumption has to borrow paddy for seeds and rice. The price of paddy seeds in villages is usually very high and varies with the demand and the interest of paddy borrowed is still higher. It would afford them relief if they can get these cheap.

(*c*) I would not do this.

Yes, I would do away with usufructuary mortgages in the cases of ryots.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—(*a*) It would be useless to try this as the law of inheritance will gradually bring this about. This is a land of small holdings and I would rather think of introducing intensive cultivation in these small holdings.

(*c*) I think if these small estates are taken under the Court of Wards, much good could be done to these estates. It is a fact that estates of minors or widows are difficult to protect.

QUESTION 8.—IRRIGATION.—(*a*) In this district, the rainfall is sufficient and I do not think irrigation is necessary. I would not, however, say that irrigation might not improve agriculture in special areas but I think the money that may have to be spent for irrigation might be much more usefully spent in more important and pressing agricultural needs.

Parts of this district are liable to heavy floods and what we want are flood embankments which would enable ryots to reclaim large areas which are now not cultivated for damage by floods. As these areas comprise the estates of more than one zamindar, Government action is necessary for the erection of embankments and their maintenance by raising the costs from those who would benefit by them with some Government contribution where necessary.

There are also water-logged areas which could be made fit for cultivation if the water is drained out.

Dredging of silted up rivers is very important: but in this matter too Government must help with dredgers.

QUESTION 9.—SOILS.—(*a*) (*i*) It strikes me that for want of sufficient water escapes in the railway embankments, tracts of land have been made unfit for cultivation and provision for sufficient water escapes should be made compulsory during railway construction.

(*iii*) By planting such plants as *dhaincha* to arrest the silt and retard the force of the current.

(*b*) Yes, this is of yearly occurrence in the *chur* areas. What appears to be a fertile area is made absolutely barren by the deposit of sand during flood and barren areas are made rich by the deposit of silt.

The great earthquake of 1897 was responsible for entirely changing large areas in this way.

In parts which are not subject to floods, e.g., the *pargana* of Ghulla, the general complaint is that the fertility is decreasing.

(*c*) The problems are different in different areas. A large tract of country at the foot of the Garo Hills alongside the river Jinjiram, has become unfit for cultivation from excessive flood. Embankments would protect the area against floods but unless Government takes it up, it is impossible to do anything as this would extend through several estates. Expert advice is necessary for the reclamation of similar areas.

QUESTION 10.—FERTILISERS.—(*a*) Chemical analysis of soil could disclose how it can be enriched and fertilisers should be applied after such examination.

Plots could thus be made fit for special crops by applying special manures.

We want agricultural experts to do this for us, and advise what manures would be suitable for special crops.

Just at present the bones of dead animals are being collected and exported to the mills. These, if utilised locally, would act as fertilisers but they usually take a long time in natural process. I think local tenants could be taught how these bones could be quickly converted to fertilisers so that local cultivators could get full advantage of this.

(*c*) Demonstration after chemical analysis.

(*f*) Education; but I do not think the use of cowdung as fuel is excessive.

QUESTION 11.—CROPS.—(*a*) (*i*) By ensuring the purity of seeds, application of suitable manure and the use of improved implements; expert advice is however sought.

(*ii*) It should be the duty of agricultural experts to advise the agriculturists as to which new crops might be introduced with advantage. They should first examine the soil, make experiments and then demonstrate them in plots of lands belonging to ryots.

There are several new crops, e.g., spices, vegetables, etc., which the East Bengal cultivators who have taken up lands in this district have grown with profit but the local men have not yet adopted them.

(*iii*) There should be seed stores in villages from which seeds could be readily purchased by the ryots. They should be given free for demonstration or lent. The Demonstrator-*pundits* may be in charge of the seed stores and demonstrations.

(*iv*) By a liberal grant of licence for guns. But the abuses should be prevented and such licences should not entitle agriculturists to use them for sport, or else it is inevitable that certain species of birds and beasts would soon become extinct.

(*c*) (1) Certain varieties of rice, jute and spices.

(2) Kitchen vegetables, cauliflowers, cabbages, beans, Shillong potatoes, melons, etc., have been introduced here during my time and are getting more and more popular.

QUESTION 12.—CULTIVATIOION.—(*i*) & (*ii*) I would leave these to experts who have practical knowledge: but it is certain there is ample scope.

QUESTION 13.—CROP PROTECTION, INTERNAL AND EXTERNAL.—(*i*) Existing measures are certainly not sufficient; by existing measures I mean traditional measures known to the ryots. Scientific measures are needed.

The few officers that we have are unable to cope with the work and then instances of pests, etc., do not come to their knowledge at all. When there is a pest, specimens have to be sent to distant places and by the time remedies are suggested the mischief is done. The demonstrator-*pundits* might be instructed by Entomologists about the remedies of pests, etc., but when there is anything new, there is bound to be delay; but benefit would come in future.

(*ii*) Purity of seeds should be first ensured: if by internal measures are meant treatment of soil, then it is for experts to advise.

QUESTION 14.—IMPLEMENTS.—(*a*) Heavy machinery fit for large holdings would not be usually suitable for the ordinary ryot. There would arise difficulties in finding capital, organising co-operation and mutual trust, without which heavy machinery could not be worked with advantage in small holdings.

Cheap and light agricultural machinery which could be worked by hand or bullocks could be introduced with advantage.

(*b*) By demonstration in their own lands or near their homes.

(*c*) Foreign manufacturers would not know exactly what implements would be suitable for agriculture here and for that mechanical engineers should, in consultation with agricultural officers, first find out what implements could be introduced with advantage. When they are found successful by demonstration sale depôts for such implements should be opened at accessible centres.

One thing suggested itself to me several years ago. The ryots usually have to dive during floods and cut jute stems one by one. Thus they become unfit for work in an hour. If an instrument could be made by which they could cut jute stems from boats, they can work for hours. I

explained this to the Agricultural Department but they did not follow me and sent me a sample something like an axe. What I had suggested was something like a machine for lopping off branches of trees, inverted. I am still of opinion that this would be most useful.

QUESTION 15.—VETERINARY.—(*a*) Under this, I would mention that although elephants are plentiful here, almost nothing has been done for their treatment or how to utilise them fully. Evans's book is the only one which was compiled years ago and since then nothing appears to have been done and the treatment of these valuable and useful animals is still entirely in the hands of quacks.

I would amalgamate the Veterinary Department with the Medical.

(*b*) (*i*) There is one dispensary under the Local Board in the headquarter station at Dhubri, but it has neither a hospital nor is it in any sense well-equipped.

I have already stated that I would place this department under the Medical and put Veterinary Surgeons in dispensaries in the mofussil. The present number is utterly inadequate.

(*ii*) No.

(*iii*) I would have the research institutions under the Government of India which should serve all the Provinces. The provincial officers could direct and inspect as the Civil Surgeons do in case of mofussil dispensaries.

(*c*) (*i*) This is not possible when the dispensaries are located very far off and one dispensary cannot certainly cope with the requirements of a district. Then there is prejudice against Veterinary Surgeons and very few people would come to them but prefer consulting quacks. This has to be overcome by showing that cattle could be successfully treated and the prejudice will slowly wear off as has been the case with the treatment of human beings.

(*ii*) I have no experience: but I think putting Veterinary Surgeons in mofussil dispensaries would be better. Travelling dispensaries would be necessary during epidemics. I would define jurisdiction of dispensaries.

The Veterinary Surgeons should work free during epidemics and for visits when taken for treatment they should have a fixed scale of fees but their visits should be compulsory.

(*d*) I would not have coercive measures at the present stage. The number is very insufficient now. There should be trained men for Inoculation for coping with epidemics just as there are Vaccinators. Those willing in villages might be trained and paid like Vaccinators when their services are needed.

(*f*) Prejudice: no fee should be charged and when people see the efficacy of treatment, prejudice will die away.

(*g*) Yes; nothing has been done about elephants. I would have the research institutions centralised under the Government of India.

I have no knowledge of the Muktesar Institute.

QUESTION 16.—ANIMAL HUSBANDRY.—(*a*) (*i*) Investigation in these matters is necessary before one can say in which way livestock could be improved. It is however necesary that an attempt should be made to improve the local varieties by cross-breeding rather than that we should import wholesale, as the local varieties thrive better while imported varieties gradually deteriorate.

(*ii*) The dairying industry is still in its infancy and the methods most crude. Scientific methods are certainly necessary to improve the present state of things. It is notorious how the local milch cows give very little milk. There are large herds of buffaloes which give milk. Dairying could be introduced with great advantage with buffalo milk.

(*iii*) The care of cattle should be taught. At present very little is done for their feeding and no one wants to go to any expense for the draught cattle one has.

(*b*) (*i*) There are very few common pastures: there are some in *khas mahals* but they are not adequate.

(*ii*) Not in vogue here: the borders are too narrow here and neither fields nor pasture lands are enclosed.

(*iii*) I do not think there is insufficient dry fodder: if, however, owners of cattle sell straw without storing enough for their own use, it is impossible to do anything.

(*iv*) In these parts there is not so much want in the dry season as during the flood months when all lands are submerged and nothing could be had. This happens during August, September and October. After the floods subside, cattle disease breaks out due to eating stale grass. What we want is the introduction of such fodder crops which could be stored for use in these months. We want expert advice about these and demonstration.

(*v*) This is for scientists to find out.

I think that each ryot should be taught to keep a plot of land for his own cattle and grow fodder crops there: It would be idle to ask land owners to keep free grazing grounds. If grazing grounds are reserved, ryots should pay a fee for each head of cattle.

(*c*) I have already mentioned that the fodder difficulty is most acute from August to October. Some difficulty is also felt in parts during March and April. In May, young shoots spring after showers which are fit for young growing cattle.

(*d*) We depend upon the Agricultural Department to find out which fodder crops could be grown in these parts and stored for the wet months. In the Punjab and the United Provinces this is done, but I do not know if those varieties could be stored in this damp climate.

(*e*) This depends on the type of men; there are many who take keen interest. The welfare of the tenantry would be the greatest inducement.

Landowners could keep grazing reserves, but the owners of cattle should pay a fee for grazing. Several attempts have been made in Gauripur estate and the difficulties encountered could be explained during oral evidence.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(*a*) From enquiries made here, I learn that an agriculturist would be occupied for more than nine months in the year, the time when they are free being different in cases of men cultivating different crops.

During the slack season he attends to the repairs of his house and other domestic duties.

(*b*) There are many subsidiary industries which the agriculturist might take up, such as weaving mats, bamboo and cane work, weaving, poultry, sericulture, lac, etc., and the local people do one or more of these desultorily. If Government give expert advice, advancing small capital where necessary, supply cocoons and lac-seeds and arrange for the sale of articles made, people would be encouraged to take up suitable home industries and stick to them when they find them lucrative.

(*c*) Want of expert advice and capital.

(*d*) I think the time is not ripe yet for the establishment of industries as are mentioned. The money available would be better spent if the people are first taught to improve their condition by scientific agricultural methods.

Some industries on co-operative principles, in whose profits the people might participate, might be first tried.

(*e*) The ryots are fully engaged in these parts and I do not think they will benefit by industries being established in rural areas. This might result in the next generation being diverted from agriculture.

(*f*) Yes, labour-saving simple apparatus which could be worked by hand would largely benefit the people. In order to ascertain the needs of the people and devise appliances, careful inquiry must be made by mechanical engineers in consultation with agricultural officers and the successful appliances should then be demonstrated to make them popular.

(*g*) The rural population in these parts haev little leisure for employment.*

(*h*) Small village organisations should be started by Circle Officers (Government), the members of which should be educated in sanitation, etc., so that they might improve the health conditions of the rural areas.

* But see reply to Question 26104 on page 125.

Trained midwives might teach the womenfolk the care of children, etc. Arrangement for recreation should also be made both for the men and women.

QUESTION 18.—AGRICULTURAL LABOUR.—(*a*) *High wages*: The cultivators do not want imported labour. It is the farmers who do not work themselves who have to depend upon hired labour and it is becoming increasingly more difficult to procure labour except at wages which leave no margin of profit to the farmer. The farmer must take to more remunerative crops so that he can import labour on high wages.

(*i*) & (*ii*) Labourers might come temporarily but there is little chance of their settling down for good in these unhealthy places. In a few cases only such imported labourers have permanently settled (e.g., Santhals in Kachugaon and forest reserves).

(*b*) Because most farmers cannot pay attractive wages to imported labour in these parts.

The agriculturists do not require imported labour.

QUESTION 19.—FORESTS.—(*a*) Grazing facilities in forests are given only during floods. If by the use of the forest lands for agricultural purposes is meant the lands within forest areas fit for cultivation, then I would say that such lands are already under cultivation.

We would want expert advice and it is only because we entertain the idea that grazing would affect the growth and improvement of forests, that grazing is not formally permitted, although as a matter of fact, I should say, cattle do graze everywhere in forests.

(*b*) Quick growing permanent trees should be planted in places not occupied by cultivators for fuel purposes. There are other special annual plants used for fuel which could be grown on the borders of fields.

QUESTION 20.—MARKETING.—(*a*) Not at all—for want of roads and communication. I would mention Golakganj railway junction where a large area was set apart for the market in the hope that it was bound to expand due to its excellent and advantageous position. The railway authorities would not shift level crossings and the Local Board would not sanction roads leading to it. The result is that there has not been any appreciable improvement during a period of fifteen years. The merchants do not want to remain in this market as they do not get sufficient trade.

I do not know if the subject of uniform weights and measures would come under this head: but I would like to mention that there should be standardisation of weights without which the cultivators are imposed upon in several ways resulting in great loss.

(*b*) The existing system of marketing is not at all satisfactory. If the price of a certain article is high, the grower does not get much profit as it passes through many intermediaries.

I would take jute and describe the process up to a certain point. The grower usually has to entrust his jute to some one in the village who has a boat on commission sale. That man charges boat hire, takes a commission and sells the jute in a market to some petty merchant generally styled *faria*. This *faria* would sell the jute to purchasers of large firms; both of whom—I mean the *faria* and the purchaser—would make some profit. The jute will then be assorted, pressed and sold to a Calcutta firm and despatched by rail or steamer. I have no personal knowledge of what is then done. If the price of jute at Calcutta be Rs. 12 per maund, the grower would not get more than Rs. 5 or Rs. 6.

(*d*) A good deal might be done to benefit the cultivators by giving them expert advice based on statistics. It would not do to supply them with crop return, reports, etc., but they should be advised as to which crops are likely to be in demand next year, and which of them should be reduced based on the stocks. They might also be advised on the meteorological reports if any crop should be sown early or late.

I would illustrate this by the example of the price of jute this year which is almost half of last year's rates. The cultivators got very high prices last year and so extended the jute crop this year but the fall of prices has ruined many. The Government was in possession of statistics as regards the stocks and if the cultivators would have been warned, they would not have increased the cultivation of jute this year.

There might be advisory boards consisting of officials and non-officials through whom these could be widely circulated.

QUESTION 22.—CO-OPERATION:—(*a*) (*i*) & (*ii*) I have indicated before that the success of the co-operative movement would depend upon the spread of education. There are serious difficulties to overcome in rural areas where the interests of the intelligent and well-to-do villagers are directly opposed to the spread of the co-operative movement. Those people lend money and food-grains, etc., at very large rates of interest. The principle of co-operation is however so very sound and this is so full of potentialities that this movement is bound to grow and do immense good to the people; but their progress would be slow in areas where the men are not educated.

I should prefer Government direction assisted by willing non-official workers.

(*b*) I think all the societies mentioned in (*i*) to (*viii*) would be possible and very useful excepting (*v*), which I think, would not be practicable under the present law.

The financing, however, should not be made dependent on contribution by the members and must be supplemented by Government loans where private capital is found to be shy.

I would lay much stress on sale societies so that the middlemen's profit might come to the growers themselves.

I think the Gauripur Co-operative Credit Society was the first of its kind in Assam but it had to be put to liquidation as the Registrar of Co-operative Societies would not allow us to work it in the way we considered in the best interests of its members. This was long ago, and, since then I am not in touch with the working of existing societies.

(*ix*) I shall think that want of recreation or amusements both amongst men and women of villages is taking away the enjoyment of health and life. Formerly the various religious ceremonies gave opportunities of meeting and served to enliven them. These are gradually dying out and nothing has replaced those institutions. Societies should now take the place of the old village committees and devise means for social amenities.

(*c*) I would not have recourse to coercive measures: besides, these measures will not be warranted by law.

QUESTION 23.—GENERAL EDUCATION.—(*a*) Please see my answer to Question 2 (*xiii*) (*a*).

(*b*) (*i*) Rural education should take the form of demonstration on village plots, technical and expert advice.

QUESTION 24.—ATTRACTING CAPITAL.—(*a*) To show them practically that such vocation would be paying.

(*b*) The tenants who have no abiding interest in the lands they have, cannot be expected to invest in improvements, the full benefits from which they cannot enjoy. The rights of tenants both under Government and zamindars are restricted but they could be depended upon for very sympathetic consideration as the prosperity of tenants ultimately benefits the landlords.

Want of capital is another factor.

QUESTION 25.—WELFARE OF RURAL POPULATION.—(*a*) The prosperity of tenants would depend upon an increase of income and cultivating thrift. Another great evil is litigation which is mostly the work of village touts.

(*b*) Yes, such surveys would disclose the real state of existing things. They should be accurate and dependable and must be conducted by responsible and educated Government servants.

QUESTION 26.—STATISTICS.—(*a*) Statistics, as now made, are not accurate. They are based on reports of *chowkidars*. If they are made at all, an intelligent agency must be employed to collect them. I have already indicated above, how expert advice could be given to tenants based on statistics which might be of valuable service to them.

Oral Evidence.

26061. *The Chairman:* Mr. Chakravarty, you are Dewan of Gauripur Raj?—Yes.

26062. You have provided us with an interesting note of your evidence; do you wish to make any statement at this stage?—No.

26063. On page 113 of your note on the question of research, you say you think that all research should be handed over to a central institution for all-India?—Yes.

26064. Do you think a central institution would be capable of making due allowances for local conditions and carrying out the experiments to the point of adapting them to local needs?—I think it is quite possible if it is well equipped; it is better to have one well-equipped institution than ill-equipped institutions in different Provinces.

26065. You think it might be possible to reproduce the climatic and soil conditions of, let us say, Madras and the Punjab, in one and the same institution?—I think so to a certain extent. Of course, it is not altogether possible even in the present circumstances; if there is a research institution in Shillong, it does not work under the conditions that obtain in other parts of the Province; the conditions are quite different.

26066. Would you have any local institutions at all?—Well, that depends; I am not an expert so that I could not tell you much about it, but I think the result of experiments made in the central institution might be utilised by the local experts.

26067. Do you want some up-to-date laboratories for carrying on research work?—Yes, I should say so; but at the same time, I should like to have all research work under the Government of India; in one central research institution.

26068. In what you say about agricultural education are you thinking of educating boys for the Agricultural Service or the other branches of the public services, or are you thinking of educating boys to equip them as farmers?—I should start the agricultural education from the very beginning, from the primary stage; it should be adapted to the age of the boys, but I would not make any distinction between agriculturists and non-agriculturists in that respect.

26069. You think a certain proportion of those boys might go back to the farm?—Yes, I should specialise from about the Class VII of the high school; up to that I should make it a general subject in all ordinary education.

26070. Then you give us your views about the improvement of the economic position of the agriculturists in such countries as Japan. Do you know much about agriculture in Japan?—No, I have no personal experience; I merely know from what I have read.

26071. You say that the ryot in India is growing poorer and poorer?—Yes.

26072. What makes you think that?—From experience I see that they are growing poorer, because I should say the expenditure involved has increased, but there is no corresponding increase in their income.

26073. You think agriculture in India is declining?—In what way?

26074. In the economic way?—Economically, yes; because their requirements are much larger now and agriculture is not keeping pace with that.

26075. *Sir Henry Lawrence:* What do you say is larger?—Their requirements; I mean their expenditure is growing.

26076. *The Chairman:* Has that expenditure grown because of a rise in the cost of living or because of a higher standard of living?—Both.

26077. Under the heading of Agricultural Indebtedness you say, "The ryots have gradually lost the habit of work and now employ hired labour for operations they used to do themselves." Now what I want you to do, if you can, is to reconcile that fact, if it is a fact, with the statement that the ryot is growing poorer and poorer?—What we actually see is that they do employ coolies during the jute season for cutting the jute or for taking it to places where they will ret it; I have seen that from experience; from that I say that what they used to do before they do not do now.

Of course, it depends upon the year; in a year when the price of jute is very high they can afford to do that; but in years when the price of jute is low, they would find the cost would be greater than the price they get.

26078. Do you think the productivity of the soil is getting less year by year; is that your view or not?—In some places it is, because I have often been told in some parts that the productivity is getting less and less.

26079. Of course we get used to hearing about the good old days in more directions than agriculture; do we not?—Yes.

26080. Have you got any facts to go upon in regard to this matter?—It is so, because formerly the area cultivated was very much less than it is now, and the manures they had, cowdung and other things, were quite sufficient. Nowadays they sow on the same soil every year, whereas formerly, after taking one crop, they would probably leave the land fallow for two or three years; they cannot afford to do that now. That is perhaps the reason why they do not get as large a yield as they used to get.

26081. If you burn down virgin jungle and take a couple of years' crops off the land, you enjoy a degree of fertility which you cannot in reason expect the land to maintain unmanured?—No, we cannot; but what the cultivators say is that from the same plot of land they do not get the quantity of rice that they used to get.

26082. Because they do not put enough manure in; is that the point?—Yes.

26083. I see that you are prepared to go so far as to put the Agricultural Department under the Education Department?—Yes.

26084. Do you think that agriculture is of such dominating importance in the Province that the whole educational system should be subordinate to agricultural considerations?—Yes. I think if that were the policy of the Government of India from 1857, there would not have been the disinclination on the part of educated men to take to agriculture as a profession.

26085. In answer to Question 3, you cite an incident where the Agricultural Department provided you with what you believe to be bad seed. I raised the point with the Director of Agriculture when he was in the witness chair, and his view was that the seed was provided too late and that it was planted too late. He was quite prepared, I understand, on behalf of the department, to take a share of the blame for the lateness. Do you think that is a reasonable explanation of the failure?—In that case, they should have advised us not to use that seed.

26086. That ought to have been done; and there perhaps they failed?—A certain crop was damaged by floods, and we wanted only that sort of paddy which would be suitable for late sowing.

26087. On page 116 on the question of finance, you say, "the most influential and moneyed people in a village—on whom depend the success of these institutions—are generally antagonistic." Is it because they are moneylenders?—Yes, they are moneylenders and they also lend paddy.

26088. They do not like the co-operative societies lending at lower rates of interest?—They do not like it at all.

26089. As regards implements, you give an instance where you made a specific request to the department for an instrument devised to cut jute below water?—Yes.

26090. I just wanted to get from you some indication of what scope there would be for an instrument of that nature. How much of the jute is cut in flood time?—Almost all.

26091. It almost always involves diving down?—Sometimes they have to dive; sometimes they have to go as deep as their waist. Almost half the area in the Gauripur Raj is under water about that time.

26091-a. Do you think there will be a market for it?—I think it would be very much utilised if it were found successful.

26091-b. Why do you not invent one yourself?—I am not a mechanical engineer. I can only suggest.

26092. Then you are inclined to amalgamate the Veterinary Services and the Indian Medical Service; is that so?—Yes.

26093. Are you anxious to be dosed by a Veterinary Service man, or do you want an Indian Medical Service man to doctor your cow?—Not that; I wanted both departments to be under one Director.

26094. You would not merge them into one?—No. I have suggested that the Veterinary Assistants should be placed in the same place as the Sub-Assistant Surgeons in the villages so that they will be more accessible; that was my idea.

26095. Have you any idea of how many domesticated elephants there are in the Province?—No; I could not say. I can speak about Goalpara alone. In Gauripur the Raja keeps about 25.

26096. Have the numbers decreased?—Yes, certainly. During the last three years we lost about six.

26097. After all everything must die, including elephants?—But some of them died very young.

26098. Do you think that the scope for their utility is narrow and diminishing?—I think so, because none of the zamindars use them for bringing timber; they use them only for *shikar*.

26099. Is that because motors have come in?—I do not think so. Elephants are put to a different use. We have to depend upon elephants in the countryside because there are very few roads there by which we can take motors.

26100. How do you account for the decline in the extent to which elephants are used?—They have not declined in use, but what ought to be done in a Province like Assam has not been done. There are many elephants, but nothing has been done about their treatment. I think they might be more widely used than at present.

26101. *Dr. Hyder:* Do you not think the zamindars keep elephants for pomp and show?—Very little for that. It is for *shikar* that elephants are used. They do not like to put their *shikari* elephants to any other use. For inspection work in the country it is the only sort of conveyance.

26102. *The Chairman*: On page 120 you say that, during the slack seasons, the cultivator attends to the repairs of his house and other domestic duties. Is that so?—After I answered the Questionnaire, I collected some of the cultivators and questioned them; they would not say that they were free, but from enquiries I found out that there are two or three months during which there is no work.

26103. What do you mean by domestic duties?—They repair their houses, and perhaps put up new fences. I do not think they are fully occupied during that time.

26104. On page 120 in answer to Question 17 (*g*) you say, "The rural population in these parts have little leisure for employment." Do you wish to correct that?—Yes, I want to correct it. It was after this note was sent that I collected some tenants and made enquiries.

26105. Is all the transport in the district with which you are familiar done by wheeled carts?—Yes, by carts. Small loads are borne by the men themselves.

26106. Would you turn to page 122? You say there that the decline in religious ceremonies accounts to some extent for the lack of attraction in village life. Would you say that religion as a whole is declining in the districts?—I should think so.

26107. You do not think it has the same influence as it had when you first came to know the countryside?—I do not think so.

26108. *Sir Thomas Middleton:* I see that you are an educational reformer. You would put the Agricultural Department under the Educational Department. As I read your precis, I supposed that you would have argued the other way and that you would put the Educational Department under the Agricultural Department?—It means the same. I want both under one head. There will be a Civilian Officer at the head of the two departments and there will be agricultural and educational experts under him.

26109. But you regard agriculture as so important that it should condition the whole educational service of the country?—Yes. Of course where specialists are necessary specialised education may be provided.

26110. You would begin to teach all the boys from the time they are in the middle vernacular or English school?—Even from the primary classes.

26111. You would begin to teach them in the primary classes?—Yes, that is my idea.

26112. At what age?—Of course it will not be from the lowest classes, but from the time they have learned to read I think, agriculture should form part of the curriculum.

26113. From what class would they be able to read intelligently?—From the fourth class of the primary schools, that is the top class.

26114. Then they will be able to read?—Yes; just when they are taught something of, say, history or geography, they should also study agriculture.

26115. That means, in practice, you would begin about the time they reach the middle school, that is, the fifth standard?—I would start even earlier, from the top class of the primary school.

26116. I do not know how you grade your classes. How many classes are there in the primary schools?—Four.

26117. The fifth and sixth classes, where are they?—They generally go to middle English schools after the primary school. There are also some middle vernacular schools, but I think they have fallen into disuse. They go to the middle English schools after completing their course in the primary schools.

26118. Your idea is that from about the fourth standard they should be studying agriculture?—Yes.

26119. You point out, quite rightly, that if that is to be done the teachers must be properly trained?—Yes.

26120. Do you think it would be possible to train a sufficient number of teachers for all your schools?—For the primary schools it would be quite possible, because the teachers are trained in training schools and they can be taught sufficient agriculture there to meet the requirements of teaching agriculture in the lower classes. I have suggested that the duties of the agricultural demonstrator and the teacher may be combined in one man.

26121. That course has been followed in certain countries, but I understand the difficulty is that the teacher who is usually employed in the Indian primary schools has no interest in agriculture?—If he comes from the agricultural classes he will be interested, and besides, these teachers will not have a high standard of education.

26122. I have heard that when a man from the agricultural classes becomes a teacher, he wants to escape from agriculture?—That is why I say that education in agriculture should start from the beginning of the school course. The agricultural classes say that they do not want to put their sons into the schools because in that case they would not be agriculturists any longer.

26123. I think you are the only witness who has mentioned elephants. What is the value of a good elephant?—Rs. 4,000 to Rs. 5,000.

26124. What does it cost to keep?—About Rs. 120 a month.

26125. *Dr. Hyder:* What is the value of a dead elephant?—The tusk is the only thing that has a value.

26126. *Sir Thomas Middleton:* The cost of keeping it is very considerable?—Yes, it is.

26127. Is it your opinion that a great deal of the money that is spent on that might be better spent on the improvement of other kinds of stock, or would you like to improve the elephant?—Some elephants are necessary, especially in Assam, for ordinary inspection duties because that is the only conveyance you can have. Then, it depends on the rich people whether they would like to have elephants for ceremonial purposes as well as for *shikar*; if a man is keen on *shikar*, he cannot do without elephants. They cannot be had for hire.

26128. *Dr. Hyder:* Is there any trade in elephants from Assam?—There is a trade in elephants in this way that when the elephants are caught in Government forests, traders from all parts of India come and buy them. They make a profit on this.

26129. You speak of the death of a number of coconut trees; is that due to wasteful tapping?—Not at all; there was a blight, what they call rhinoceros beetle or something like that; it burrowed inside the tree and the top died away gradually. In this way, I think we have lost three-fourths of what we had.

26130. Did you report this matter to the Agricultural Department?—Yes.

26131. They could not do anything?—I do not know if they did anything.

26132. Even those trees which you kept for food purposes died?—In these parts, the coconut tree is not used for any other purpose; we do not tap it at all; it is the palm tree that is tapped, not the coconut tree.

26133. With regard to the use of bones, is there any particular caste of people which collects the bones?—I think some Mahommedan contractors collect the bones and sell them to the companies.

26134. You think these bones would be useful if they were crushed by the cultivators?—I think if they are allowed to remain as they are it will take a long time for them to be turned into manure.

26135. And if they are crushed?—I think they will be of some use.

26136. They would be used; there would not be any prejudice?—No; not for using these as manure: but the Hindus would not crush them. Some people do not like that the bones should be taken away; they like that they should remain where they are, but what I suggest is that in that case it will take a very long time for them to be turned into manure.

26137. Would you like to have a crushing plant in your Raj?—What I suggest is that if there could be a simple way of doing it, that would be beneficial, but if you have a crushing plant you will have to have it near the railway, you will have to carry the bones there, convert them into bone dust and bring it back, which would be rather difficult; the question is whether anybody will take so much trouble for the purpose.

26138. Talking of village life, have you got any village games, dances and things of that kind?—There are not many games; of course, wherever there is a school they have games like football.

26139. I was referring to the native games; are there any of them?—Boat-racing is one.

26140. In Goalpara, do the people take any interest in boat-racing?—They do take a little interest in boat-racing, but I do not know of any other local games or amusements which are largely practised.

26141. You are aware that in other parts of India the people are organising Indian games?—I have no experience of them.

26142. *Mr. Hezlett :* As regards the present educational system, I understand your chief objection to it is that the ordinary village boy who goes to a primary school gets a dislike for all kinds of manual labour; that is one of the effects, and hence you suggest that the Education Department should be abolished and made into an Agricultural Department?—No, I did not say that; I want to amalgamate both the departments.

26143. I gather from your evidence that the effect of our present primary system of education is to create in the village boy a dislike of manual labour of all kinds?—Yes.

26144. He does not want to take to agriculture when he leaves school?—That is so. But what I say is that, if he is properly trained from the very beginning, that prejudice will die away.

26145. That is the reason why you want the school converted, in the ordinary sense of the word, into a more or less agricultural school?—What I want is that just as history or geography is a subject for study, so also one of the subjects, from the primary schools up to a certain point, should be agriculture combined with demonstration.

26146. Can you tell us from what class of people the ordinary village schoolmaster comes; is he a man of the *bhadralog* class?—There are very few from the *bhadralog* class in primary schools.

26147. He comes from one of the peasant classes?—Yes; the pay that they get does not attract men of the *bhadralog* class; it is almost always the villager.

26148. Is he a man of the Kayastha class?—Not necessarily; he may be a Mahommedan, he may be a Kayastha; they come from all classes.

26149. What I want to get at is whether he is a man who scorns manual labour of all kinds?—No.

26150. He will go out to the fields and work there?—From what I have seen there are several village schoolmasters who are farmers.

26151. Why do the boys attending these schools get the idea that manual labour is a bad thing?—They come into contact with the *bhadralog*. There is a sharp distinction between *bhadralog* and *chashas;* a *chasha* in other places means a farmer; in this country it means something much worse than a farmer; *chasha* means a man without polished manners, and with little education.

26152. *Dr. Hyder:* Have you got many of the *bhadralog* residing in your villages?—There are some.

26153. *Mr. Hezlett:* What I want to know is why the present system of education gives this idea to the boys that manual labour is a thing to be despised and scorned as one of the lowest ways of earning one's livelihood; it is not the usual thing in other countries?—Because the *bhadralog* have not taken to agriculture.

26154. They look down upon and despise agriculture, and the ordinary schoolmaster more or less unconsciously implants that idea in the minds of his pupils?—I do not think so; my experience is that many of the teachers of the lower primary schools come from the agricultural classes.

26155. And still the evil goes on; the ordinary village boy who can read and write does not want to take to agriculture; why is that?—There is some reason in that; they do not know that agriculture pays and that it is possible for a gentleman to be a farmer and earn a decent livelihood from farming; that is what I mean.

26156. As regards the poverty of the ryots, you say in your evidence that you find the Mymensingh Mahommedans who come into your zamindari are much better cultivators and become wealthier than the ordinary Assamese ryots. Is it because they work harder, grow more crops and are more industrious?—They are more industrious, and they know more about agriculture.

26157. Do you find they work the whole day, start work in the morning and go on till evening?—I could not say the exact number of hours they work in the day, but generally speaking, I should say they are much more intelligent farmers and agriculturists, and they are more hard working.

26158. The ordinary Assamese cultivator does not care to work in the afternoons; he likes to go out in the fields in the morning, work there for four or five hours, and return home in the afternoon?—In Goalpara district, there are no people who take opium; opium taking is connected with the laxity of Assamese cultivation.

26159. I am thinking more or less of the Upper Assam Valley districts; you do not find them in Goalpara. In the Upper Assam districts, the cultivator is so lazy that he will not work more than four hours a day; with that he thinks he has done a full day's work?—I may cite one specific example. In an area very near Dhubri there was fallow land some years ago which the local people would not take; a man from Mymensingh side came there, took that land, and in the first year he got about Rs. 600 worth of jute, in fact more than what he paid to the zamindar; that was during the floods; I found that the local people could not cut one stem of jute on the plots adjoining that area, but this man dived and cut every stem of jute, and got Rs. 600 worth of material.

That is an example of energy and what it can do.

26160. About elephants, is it not a fact that elephants are used in the timber trade to drag timber?—I have no experience of that personally.

26161. In most of the Upper Assam Valley districts elephants drag the timber during the cold weather, and are used for *shikar* during April and May?—We have started the experiment now, in Gauripur Estate.

26162. You mentioned Rs. 5,000 as the price of an elephant; that is the price of a good elephant?—Yes, not when they are caught.

26163. A *shikari* elephant costs about Rs. 5,000?—A good *howdah* elephant would cost much more than that. What I say is that a normal, full-grown, good elephant will cost about that amount.. When they are purchased I think the cost will be Rs. 2,000 to Rs. 2,500 but many of them die, and it is risky to buy elephants like that; you will have to wait for four or five years before you make use of them.

26164. *Prof. Gangulee:* At the beginning of this century, one of the Assam Commissioners expressed his hope in regard to agriculture in this way; he had little hope that improvement will be effected in these matters till reformers arise among the landowners themselves. Do you agree with that view?—Do you mean to say that unless the zamindars are the actual agents who can improve agriculture, there will not be any agricultural improvement?

26165. Till reformers arise among the landowners themselves?—I do not think so.

Note by the witness:—The co-operation of zamindars would be certainly a great help to the cultivators, but there is this consideration that the zamindars have now very little influence over their tenantry and the latter think that as long as they pay rent, there is no more obligation in their part and they are being taught to look with suspicion on all measures attempted to be introduced by zamindars.

26166. You do not agree with that?—No.

26167. Are you aware of the agricultural development of other countries?—No, I have no personal experience of that.

26168. Of England, for instance?—No.

26169. The Gauripur Raja is one of the prominent landowners of this Province; what is the area of the estate?—600 square miles.

26170. You have a demonstration farm?—Only one farm.

26171. Where is it situated?—About three miles from Gauripur.

26172. It is managed by the estate?—Yes, it is managed by the estate. Originally I should say it was not anything like an experimental or demonstration farm; it was a farm originally for producing certain varieties of rice and other things for the consumption of the Raj family; gradually it has developed into some sort of an experimental farm in the sense that we have lent a certain area to the Agricultural Department, who try jute, sugarcane and paddy on it.

26173. Do you contribute to the expenditure of the farm?—The whole expenditure is borne by the estate.

26174. You have an agricultural officer in charge of the farm?—No; the few *bighas* that are with Government are under the inspection of the Agricultural Department.

26175. Since when has the demonstration farm been going on?—For six years.

26176. You have no agricultural officer appointed by the estate?—No.

26177. You depend for your demonstration and experimental work on the Department of Agriculture?—Yes.

26178. *Sir Henry Lawrence:* How much do you spend on it?—About Rs. 3,000 or Rs. 4,000.

26179. *Prof. Gangulee:* What is the area of the farm?—About 150 acres.

26180. Does any demonstration work go on there?—Demonstration goes on only in the area which has been lent to Government.

26181. Your tenants come and attend such demonstrations?—The Agricultural Department often invite other people to see a successful crop.

26182. Is any demonstration held on your farm?—That sort of demonstration is not held on my farm.

26183. So, it cannot be called a demonstration farm?—No.

26184. Do you tour about a great deal in your estate?—Yes.

26185. Can you tell the Commission whether you have introduced any change in the method of cultivation, as, for instance, the use of manure and things of that kind?—They are very slow to take to improvements.

26186. How long have you been the Dewan of this estate?—I have been there for about 24 years.

26187. And you have not seen any decided change in this period?—If you show them by demonstration that by using a particular manure the yield will be larger, they will take to it. I know from personal experience that they have taken to certain varieties of paddy which have been found very successful in that farm, and also to a certain variety of jute.

26188. Your tenants are interested in improved varieties of jute and improved varieties of rice?—Yes.

26189. Have you any seed stores?—No.

26190. You do not assist your tenants to get better varieties of seeds?—Whenever we do it, we do it through the Agricultural Department. After the floods we have tried certain varieties from the Sylhet district, but I cannot say that we have done it systematically.

26191. In this note that you have given us you evince a good deal of interest in cattle improvement. Have you any cattle farm?—No.

26192. Gauripur Raj has no special breed?—No.

26193. From where do you get your milk-supply?—We buy some cows; that is all.

26194. You have no dairy of your own?—No.

26195. Have you any co-operative society?—I think we had the first co-operative society in the Province started in the Gauripur Raj in 1904. I think it was in 1916 that the last society went into liquidation; there was a difference of opinion amongst us and later on all the societies which were started were run by the Government Co-operative Credit Societies Department. The estate had nothing to do with them.

26196. Do your tenants borrow money from you?—We have not got any agency for giving money. It is only for very special reasons that they borrow money. When there is a hardship caused by floods or some such things we do lend out money.

26197. What are the chief crops grown by your tenants?—Paddy, mustard seeds and jute are the principal crops.

26198. Do you assist your ryots in marketing jute?—We have not done so, but we had a discussion with the Deputy Director of Agriculture on the question of starting a co-operative credit society for marketing jute.

26199. Do you supply them with any information with regard to the market in Calcutta?—We do not, but I have suggested that something ought to be done for them.

26200. You refer to your educational system in this note. I do not propose to go into details, but what I want to ask you is whether you have a number of primary schools maintained by your estate?—All the primary schools are maintained by Local Boards. Formerly we used to contribute towards the upkeep of these primary educational institutions, but it has now been discontinued not because we did not want to give the money but because the Local Boards wanted to take up the full cost of the education in the primary schools.

26201. The Raja takes a good deal of interest in Local Boards. Is he a member of the Local Board?—Now the system is elective but there are always some members from the Gauripur estate who are not officials.

26202. Have you suggested some sort of agricultural education in your schools?—No.

26203. What were the chief causes of failure of crops during these last 24 years that you have been the Dewan of the estate?—I should say that flood is the most important cause.

26204. In reply to Question 25, you suggest that surveys ought to be made in order to find out the real state of affairs. Have you instituted any inquiry into the economic conditions of your own tenants?—No, we have not.

26205. *Mr. Calvert:* You say that you think an attempt should be made to reduce the rate of interest by legislation?—Yes.

26206. What is it that you are thinking of?—Something like the Usurious Loans Act.

26207. You have got that Act in force in your Province, have you not?—The Act is in force but seldom resorted to.

26208. Germany has now made usuary a criminal offence punishable with six months' imprisonment; would you go as far as that?—I would not go so far as that.

26209. *Mr. Kamat:* You suggest that the Veterinary Department should be amalgamated with the Medical Department?—Yes.

26210. Is that in the interests of economy?—To a certain extent, yes.

26211. How much economy would you effect if the amalgamation were done?—I am not competent to say because I have not studied the budget. I do not know much about the details of the working of the departments.

26212. From the public point of view it would be convenient to have a veterinary dispensary wherever the ordinary dispensary is located?—Yes.

26213. There would not be any loss of efficiency in the Veterinary Department by its transfer to the Medical Department?—My idea is that there should be experts under the Director, who might be a civilian. But, if you want to amalgamate these two dispensaries, there must be veterinary experts under the Medical Department.

26214. *Rai Bahadur R. M. Das:* Does the Gauripur Raj spend money over the improvement of the health and sanitation of its tenants?—We help them in this way that we subscribe to the Local Boards for dispensaries.

26215. How many dispensaries have you got?—In the whole of the Gauripur Raj, besides the dispensaries at the headquarters of the district there are four dispensaries.

26216. And you contribute towards all these?—Yes; the Gauripur dispensary is fully maintained by the estate; and there are other dispensaries towards which we also contribute something.

26217. Do you do anything in the way of imparting primary education to your tenants?—That is absolutely in the hands of the Local Boards.

26218. Your estate does not spend anything on it?—We do subscribe something for the middle English school. There are four middle schools in the Gauripur estate.

26219. You say that floods damage the crops of your tenants. Did your estate think it necessary to start any embankment work for the protection of crops?—Embankment will not do much good because it will have to be extended to other zamindaris; so if I were to do a bit, that would not help the ryots in any way.

(The witness withdrew.)

The Commission then adjourned till 11-45 *a.m. on Wednesday, the* 15*th December,* 1926.

Wednesday, December 15th, 1926.

SHILLONG.

PRESENT :

The MARQUESS OF LINLITHGOW, D.L. (*Chairman*).

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S.	Mr. H. CALVERT, C.I.E., I.C.S.
Sir THOMAS MIDDLETON, K.B.E., C.B.	Professor N. GANGULEE.
Sir JAMES MACKENNA, KT., C.I.E., I.C.S.	Dr. L. K. HYDER.

Mr. J. HEZLETT, I.C.S.
Rai Bahadur RAMANI MOHAN DAS. } (*Co-opted Members*).

Mr. J. A. MADAN, I.C.S.
Mr. F. W. H. SMITH. } (*Joint Secretaries*).

Mr. W. HARRIS, M.R.C.V.S., I.V.S., Superintendent, Civil Veterinary Department, Assam.

Replies to the Questionnaire.

QUESTION 1.—RESEARCH.—(*a*) (*ii*) Each Province should have its own properly equipped research laboratory in charge of an officer trained in this work. Further knowledge is still required on many diseases, such as, surra in cattle and buffaloes, foot and mouth disease, anti-rabic vaccination in animals, bovine infectious lymphangitis, nasal granuloma, etc.

QUESTION 15.—VETERINARY.—(*a*) The Civil Veterinary Department, Assam, is not under the control of the Director of Agriculture.

(*b*) (*i*) Local Boards control the veterinary dispensaries. The buildings are provided by the Local Boards who pay two-thirds of the Assistants' salary. Government pays one-third, supplies the instruments and contributes Rs. 50 towards the cost of medicines. The Assistant's tour programmes are checked by the Local Board who pays his travelling allowance. In certain cases, Government subscribes to the cost of a second Assistant in addition to the above. The work of the Assistant is checked by Inspectors. Returns of the Veterinary Assistant's work are sent by him to the Superintendent, Civil Veterinary Department. Assistants are transferred by the department but the Boards are previously consulted and their wishes considered. This system seems to work satisfactorily.

(*ii*) The demand for veterinary aid has increased and the present staff is unable to cope with the demand when contagious diseases are present. The number of Assistants has not been increased as the Local Boards are unable to provide funds.

(*iii*) The provincial authorities entirely control the Reserve Veterinary Assistants and the Inspectors.

(*c*) (*i*) Those ryots and cattle-owners in the vicinity of a dispensary make full use of the dispensaries. Only a small proportion of ryots is so placed. Dispensaries would have to be multiplied.

(*ii*) Veterinary Assistants tour with a small stock of drugs. The object being to let the ryots know of the department, to give him advice and treat sick animals. Under normal conditions the Assistant is on tour from ten to fifteen days in each month.

(*d*) The obstacles are many; such as: no notification or receipt of information too late; objection to segregation; no proper disposal of carcasses; objection to inoculation; free movement of sick and incontact animals.

Legislation would be of little use without the necessary staff to carry it out. The ryot would actively resent any interference. Legislation carried out by half measures would be of no advantage. So, under the present circumstances, it cannot be recommended. By teaching and by bitter experience the ryot may gradually come to appreciate the advantages of these essential points. Segregation, disposal of carcasses, etc., entail extra labour and are not popular. Contagious diseases are often deliberately spread by *Chamars*.

(*e*) There has been little or no difficulty in securing sufficient serum.

(*f*) The obstacles against preventive inoculation are religious objections and apathy of the cattle-owners. No fee is charged for serum inoculation.

(*g*) I consider that further facilities for research in animal diseases are most desirable and important, first by an extension of the Muktesar Institute, and second by setting up provincial veterinary research institutions.

(*h*) I would suggest that special investigations should be conducted by officers of the Muktesar Institute, but as it is necessary to study diseases under varying local conditions provincial officers would have to do this.

(*i*) I recommend the appointment of a Superior Veterinary Officer with the Government of India. He would act as adviser to the Government. This seems to be done at the present time by the Director of the Muktesar Institute and thus his legitimate work of research and control of a large institute is interfered with. Research work would be synchronised and overlapping prevented. Educational work requires speeding up and making more uniform. His advice would be sought on professional questions that may arise from time to time.

QUESTION 16.—ANIMAL HUSBANDRY.—(*a*) Improvement in the breed of the local cattle and an increase in the yield of milk are much to be desired; until the cattle-owner shows a genuine desire for improvement on these points no real advance can be made.

(*b*) The grazing grounds for village cattle are usually overstocked. The herd contains a large number of useless animals rendered so by age and disease. Much of the disease is parasitic and the grazing ground becomes badly infected. The owner is unwilling to get rid of these useless animals.

It is a common custom to cut off the ears of rice and leave the straw standing for the cattle to graze on. Straw may sustain life but it is not a diet for the production of energy or milk. Straw with a little grass and weeds is the only food that many village cattle get.

There seems to be a deficiency in mineral constituents in the fodder as shown by the small bones and joints of cattle and horses bred in the plains.

Generally speaking, there is a fodder shortage during the last half of the cold weather, during the hot weather and again in the middle of the rains when the grazing grounds are flooded.

With the exception of growing green fodder crops, conserving the straw and feeding on grain, no further suggestions can be made.

Oral Evidence.

26220. *The Chairman:* Mr. Harris, you are Superintendent, Civil Veterinary Department, in the Province of Assam?—Yes.

26221. You have given the Commission a note of the evidence which you wish to tender. Do you desire to make any observations at this stage other than those covered by the note?—I have nothing further to say.

26222. What staff, if any, have you under your own control at headquarters?—At the present time I have nine Reserve Veterinary Assistants, one Staff Assistant in Gauhati, three Inspectors, one in Gauhati,

one in Dibrugarh and one in Silchar, and also one other Staff Assistant in Silchar.

26223. Where are most of these officers trained?—All in the Bengal Veterinary College.

26224. You have, of course, no training facilities in this Province?—No, not at all.

26225. Is that staff reasonably adequate?—We find it very inadequate. We had a very heavy outbreak of rinderpest in the last two years and we found it very difficult to cope with the work; with double the staff we can get on with the work.

26226. Is there difficulty in financing in this Province a sufficiently large staff to deal with these epidemics when they arise?—Yes; that is the difficulty. We want a large staff. If a large number of cattle are affected at one time, it is very difficult to manage and we have no facilities for stopping the movement of cattle or anything of the sort, although the disease is spreading rapidly.

26227. Do you suggest that there ought to be powers enabling you to stop the movement of cattle?—I have made mention of it in my note and I say it will be no use giving us powers without the necessary instrument to carry them out.

26228. Efficiently to administer rules of this sort in a country of this nature would require a very large veterinary police force?—Yes and a tremendous amount of opposition would be met with.

26229. So that, broadly speaking, it is your view that the time has not yet come for legislation directed towards that end?—That is my view at present.

26230. On page 132 of your note, you give a list of the diseases which in your view need further attention. We have had a certain amount of evidence tending to show that the elephant which is an important animal in certain districts in the Province is not receiving the attention which it deserves; do you agree with that?—As regards the general treatment, yes. It requires more study; persons in charge of elephants know very little about them. I have made a point of studying elephant troubles and diseases and more care has got to be taken of elephants by officers under whose charge they are. The elephant is entirely under the control of the *mahout* who is rather an ignorant person; but if the *mahout* disagrees with anybody, there is no other man to take his place and it is very difficult to control the *mahouts*.

26231. I suppose there is a parasitology of wide range which is specific to the elephant?—Yes; we have a lot of parasites specific to the elephant There is one faseiola in the elephant which is different from the cattle one.

26232. Would you be prepared to add the diseases of elephants to this list of subjects which require attention?—Yes.

26233. On the same page of your note you say, "Local Boards control the veterinary dispensaries." I gather from your note that on the whole you are satisfied with the manner in which the Local Boards are carrying out their responsibilities in this direction?—Yes; I am satisfied generally; but I am dissatisfied because the Local Boards do not employ more Assistants. They employ one and sometimes two Assistants ; but these are very insufficient for the area controlled by the Local Boards.

26234. These are the Assistants who are trained in Bengal?—Yes.

26235. Are they mostly men who have gone from the Province to be trained in Bengal and go back to the Province?—Yes; all belong to our Province with one or two exceptions.

26236. Do you find constant inspection of the Assistants' work necessary to keep them up to the mark?—It is necessary indeed.

26237. Have you had many complaints of bribery and like charges against the Assistants?—We have very few cases like that. We are always watching and inspecting their work.

26238. In connection with inoculation, I see on page 133 of your note you say that you meet with a certain amount of obstruction on religious grounds?—Yes.

26239. Is that common in the Province?—It is comparatively common, yes.

26240. Amongst what people?—Amongst the Hindus.

26241. You do not think that it is put forward as an excuse by a man who does not want to lose two or three working days?—No; I do not think so because the serum inoculation will not make him lose any working days.

26242. It is the single or serum-alone method and not the simultaneous method?—No; we cannot carry out the simultaneous method in this Province, there will be great objection to that method.

26243. Have you had many casualties?—We had no casualties from simultaneous inoculation at the Government farm; but we had one or two afterwards from piroplasmosis.

26244. Are you satisfied on the whole with the service rendered by the Muktesar Institute?—Yes; I am quite satisfied on the whole.

26245. Do you wish to put before the Commission any views about the position of the veterinary head of the Muktesar Institute? Have you any scheme in your mind for the creation of a post of Veterinary Adviser to the Government of India?—Yes; I think there should be a Veterinary Adviser to the Government of India and the Director of the Muktesar Institute should be free to run the Institute and carry out the research work.

26246. You mean you do not think that one and the same person could fill the dual roll of Veterinary Adviser to the Government of India and effective head of the research work at Muktesar? Is that your view?—Yes; that is my view. When research work is going on, it is very difficult if it is often interrupted. Experiments and things like that often go wrong if they are interrupted.

26247. Have you in the course of your experience in the Province studied the indigenous method of veterinary medicine at all?—Yes, a little bit of it; we tried a little of it but not very much.

26248. Have you come across anything valuable in that system?—Nothing valuable at all. We are trying indigenous medicines but drugs such as astringents, etc., prepared by our methods are equally good or probably more effective. I cannot see anything valuable at all in them.

26249. Have you got a pathological laboratory?—Yes; I have a little laboratory for diagnostic work.

26250. Do you use any other laboratories in other Provinces for that purpose or do you send the material to Muktesar?—I send material from suspected rabid cases up to Shillong; I do not deal with them in Gauhati; I send them up here for diagnosis.

26251. There is a considerable horse population in the Province, is there not?—Yes; they are both imported and bred in the Province, hill ponies.

26252. Can they be bred satisfactorily in the Province?—No, they cannot be bred for our work because they are very weedy.

26253. Is that due to the lime deficiency?—Yes, partly; a great part of it is due to lime deficiency, and a great deal is due, of course, to haphazard breeding, having no idea of the simple methods of breeding and selection.

26254. Is the smallness of the size of the horse a matter of choice or of necessity?—It is simply a matter of necessity; with their methods they cannot breed better animals. They would rather have them stronger but they cannot breed them stronger. They used to have a very fine type of horse in Manipur, the Manipur ponies. Some time ago I was talking to the Raja about improving the breed, but he said the *gurus*, who are Hindu priests I think, would not allow him to breed from stallions over three years old. That is of course a great mistake as they are not then sufficiently mature. He was not using mature ponies to breed from. That is one of the reasons why the Manipur ponies have degenerated.

26255. It seems rather a serious invasion of the secular field; is that some religious sentiment?—Religious sentiment, yes.

26256. Have Government ever provided premium stallions in the Province?—No, we do not do that.

26257. Do you think the number of horses and their value to the cultivator are sufficiently important to justify a policy of that sort?—No, not at all. All work is done by bullocks here; there is very little done by ponies.

26258. Do you know the horse population of the Province?—Not offhand; I cannot remember what it is; it is not very great.

26259. We have heard from other witnesses something about the cattle problems in the Province; I do not know whether there is any special branch of that subject in which you are particularly interested; we should like to hear your views if you care to put them before us?—I have made some remarks on page 133 of my note. I find it is a very difficult problem to tackle, for various reasons; one of the chief reasons is the fodder shortage; there is also the lack of milk for young animals, and the lack of knowledge of any principles of breeding. Another point, and a very difficult one, is that we cannot get rid of the inefficient animals; the old and diseased animals are allowed to linger on, increasing the number of cattle. If they could be removed in some way, it would be a great benefit, but we cannot do that.

26260. Is it your view that a substantial improvement in the condition and working value of the cattle might be achieved by improved nourishment without any alteration in the breed?—Yes, undoubtedly; the present breed could be improved considerably by improved nourishment and selection.

26261. But the rural population has no conception of breeding policy at all?—Absolutely none at all, and they will not help in any way. For instance, we had two very good bulls in a place called Silchar; I might point out our difficulties there. The people would not bring their cows for service. We itinerated the bulls; I kept a record of all the work that was being done and we examined the calves afterwards. The calves were a great improvement, but they started degenerating soon afterwards because they got insufficient milk. We tried to point out to the people that they must give them more milk, but it was not done; the calves were starved and so the whole experiment was an absolute failure; the ryot would not take the trouble.

26262. There seems to be no appreciation whatever of the fact that if you want a healthy calf you must have a well-fed mother?—Absolutely none at all.

26263. Apparently the calves are invariably half-starved?—Yes, invariably. One can see calves being sent out to the pastures, the paddy fields, with their mothers; a straw basket is tied round the mouth of the calf by a piece of string round its ears, to prevent the calf suckling; it cannot eat either, so that it is starved all day.

26264. That is to conserve the milk for domestic purposes, is it?—Yes.

26265. Have you studied the possibility of developing the sheep-grazing industry?—We tried sheep up here in Shillong some time ago. The remark was made that those low hills down the road looked good sheep-grazing grounds. It was an absolute failure for two reasons: the conditions were too wet here and there was no grass. On these green slopes on the hill sides there is no bottom grass; it is all jungle grass, very sparse, and the sheep practically starved on it. We once sent the cattle down from the Upper farm to try and graze them, but they starved.

26266. It might be possible to induce fodder grasses to grow, but that would not deal with the problem of the monsoon?—No.

26267. Is it so severe here that sheep cannot stand it?—Yes, they cannot stand it.

26268. The wet is such that they deteriorate?—Yes, it is far too wet for them. There are very few sheep bred in the Province; for that reason it is chiefly goats that are kept.

26269. Goats play an important part in the rural economy, do they not?—Yes, they are very hardy animals and there is very little trouble with them; we have really very little trouble with goats.

26270. Do the villagers consume the milk of the goats?—Yes.

26271. They depend almost entirely upon goats for their milk-supply, I suppose?—No, there are big herds of cattle; they are dependent chiefly upon the cows for milk.

26272. On cows or cow-buffaloes?—The villagers depend on cows for their milk-supply, but in many places they have milk also from cow-buffaloes.

26273. What about the milk yield of the goat; have you studied that problem at all?—No, I have not.

26274. In some European countries where attention has been paid to the problem, extraordinary milk yields are obtained, as you probably know?—Yes. I do not think there are any big yields here; they are small milk yields.

26275. *Sir Henry Lawrence:* Is there any part of the Province which is well adapted for the breeding of cattle? Conditions vary very much, do not they, between the Brahmaputra Valley, the Surma Valley and the hills?—Yes, there are areas on the low hills where cattle could be bred quite well. The plains, of course, are flooded in the rains, they are swamps, and cattle cannot remain on them and remain healthy.

26276. Are cattle removed from the swamps during the inundation season?—In places where they can be they are, but in many places they cannot be removed at all; the cattle stand up to the hocks in water for about three months in the year; they have a little floating tub in front of them and feed out of that.

26277. Can they stand that?—A lot of them die.

26278. The mortality is heavy?—Yes.

26279. Do they suffer from mosquitoes?—Mosquitoes trouble them, and also ticks and leaches; they suffer a lot from parasites of that kind.

26280. After the cattle have died from the effects of the inundation season, you have to have fresh importation of plough bullocks and milch cattle?—Yes, there is a good deal of importation.

26281. Where are they imported from?—From the more favourable parts of the Province or from outside?—There is a large number imported from Bihar; those are bullocks for cart work. The local animal is used for ploughing in paddy fields, the ploughing being simply stirring up the mud, not heavy ploughing in the European sense; it is simply puddling up the mud.

26282. Do they use buffaloes for that purpose?—Sometimes.

26283. Not usually?—In some districts the buffalo works quite well and quite commonly too.

26284. You say that goats can flourish here. Do the Forest Department not object to their entering the forests?—There is a certain amount of objection, not so much to goats as to cattle entering some of the reserved forests, because they spread disease among the forest animals. There have been several heavy epidemics among the wild buffaloes and bison through animals carrying in rinderpest.

26285. But for the protection of the forest growth there are no special restrictions put on the grazing of goats?—No, no restrictions; but not many goats go into the reserved forests; they feed round the villages and in the paddy fields.

26286. Have you any particular policy you wish to press for the increase of the livestock, whether goats or sheep or cattle, which is handicapped by forest restrictions?—No, I do not think there is anything I wish to press on that point at all; in some places there is undoubted lack of grazing, but that could be remedied if we could get rid of half the herds. The villagers keep very large herds, for which there is no use and a considerable number are useless through disease or old age. If we could get rid of those, there would probably be sufficient grazing for sound animals.

26287. The number of cattle in this Province is very much below the average, either per area or per head of population, of other parts of India?—Yes.

26288. Do you still think they are too numerous here?—I still think they are too numerous, yes; there would certainly be more food for the healthy ones if we could get rid of the diseased and unfit.

26289. *Sir Thomas Middleton:* Have you made any observations of the effect of starvation on the incidence of diseases? Can you tell me whether rinderpest attacks the animals which are most starved or whether it attacks all cattle in an area when you get an outbreak?—Taking the example of rinderpest, rinderpest makes no choice; rinderpest will attack equally your well-fed animal or your poorly-fed animal; rinderpest is not selective in that way at all. A poorly-fed animal probably has not the same amount of resisting power against other diseases, but rinderpest is not selective.

26290. In other parts of India, I have had the answer that the starved cattle were those which disappeared in greatest numbers when there were attacks of rinderpest?—I have not found that.

26291. What is the position with regard to other diseases, for instance, foot-and-mouth disease?—We have a lot of foot-and-mouth disease in this Province. It breaks out two or three times a year; the mortality is very low. What kills the cattle are wounds or lesions which become flyblown, and the animals die of septicaemia; and, of course, poor animals out of condition have less chance of resisting poisoned wounds than fit animals.

26292. What breeds of sheep have you experimented with? Were they Indian breeds?—They were Indian breeds from Bihar.

26293. Were they bred mainly for wool?—Yes.

26294. Was there any evidence of their suffering from the parasite liver fluke?—We find liver fluke in the Province all over.

26295. Was the effect of the monsoon direct, that is, the result of a continuously wet fleece, or was it indirect through promoting the higher incidence of liver fluke?—It was both.

26296. Did you form any impressions as to which had the more serious effect?—The wet fleece kept the animals impoverished and the liver fluke finished them off.

26297. You mentioned also deaths among elephants. Have you any knowledge of the intermediate hosts of the parasites in that case?—We have not worked it out; but I think it is a similar host as in other liver flukes.

26298. Therefore you suspect some aquatic or semi-aquatic host?—Yes.

26299. That is why elephants cannot withstand disease in wet localities?—The elephant stands very much wet because it eats a lot of swamp grass. It is only when the disease is imported that it spreads to the herd. Wild elephants are comparatively healthy. Sometimes we get an animal badly infected, the infection escapes notice and it spreads. I am talking about tame elephants.

26300. It spreads rapidly?—Yes.

26301. While grazing on swamp grass, does not the elephant graze high up from the ground? It does not get to short grass and therefore it would not pick up infected snails?—The parasites escape from the snails and crawl up the grass stems.

26302. Has that been observed here?—That is only an observation from a study of the parasites affecting bovines.

26303. You mention the lack of bone in horses, and you refer to the comparative excellence of the Manipur ponies. Do you know whether there is limestone in the Manipur hills?—I think there must be, because the horses there have got better bone. The Manipur cattle are much better too.

26304. Are you sure that it is not a question of phosphatic deficiency rather than of lime deficiency? We are told that Assam is very deficient in phosphates?—I should think probably it is both acting together, deficiency of lime and deficiency of phosphate.

26305. The point has not been investigated?—No.

26306. Have you noticed in any district of Assam that the cattle suffer from depraved appetites?—Not markedly, but I have noticed some cases.

26307. You refer to the need for a researeh laboratory in Assam. You instance in that connection certain diseases. What type of laboratory have you in mind and what sort of workers?—A laboratory with one qualified man and a laboratory assistant.

26308. I was rather struck by the diseases you instance, for example foot-and-mouth disease. You are aware that we are spending in Great Britain about two lakhs a year on the work of an expert committee investigating that disease?—That is a common disease, and a considerable amount of work has been done on it.

26309. You know the problems are extremely difficult?—It is a very difficult problem. It is being tackled elsewhere but still something might be done here.

26310. Similarly with regard to surra. How long ago was surra taken up in India by Dr. Lingard?—That is a matter of fourteen or fifteen years ago.

26311. It is a matter of thirty years ago, I think. That again is a very difficult problem. There must be a number of quite unknown diseases in Assam which you come across and find it difficult to explain; I should suppose that you had in view the preliminary exploration of these diseases?—The last disease that I have mentioned, nasal granuloma, took a considerable amount of our time, several years, to investigate. It began in a small way; there were only one or two cases; and it rapidly increased. We had no method of combating it, local treatment was of no use, and it was after experiment in Gauhati and one or two places that we started the treatment which was effective.

26312. I can see a great opening in a Province like this for the preliminary exploration of new diseases but some of the diseases you have mentioned could not be investigated in a Provincial laboratory?—I am only speaking about the foot-and-mouth disease.

26313. *Dr. Hyder:* The Khasis are not over-loaded with religion; are they?—No.

26314. They would not have any religious prejudice to inoculation of their cattle?—No.

26315. Has that been done?—The position is entirely different up in the hills here, because the Khasi does not use his cattle for work, and he does not use their milk. The only thing he gets from his cattle is manure. I am not talking about the Khasis in Shillong where they have changed their habits; I am talking about cattle in the Khasi Hills.

26316. He does not use cattle for ploughing his fields?—His fields are very small on the hill-side and are not adapted for ploughing.

26317. *Mr. Hezlett:* The fact is that all the hill tribes are in the same position? In the Lushai Hills they do not use milk at all?—No.

26318. So the milk problem does not arise at all in the hill districts. In recommending special research in this Province, is it your idea to investigate the special diseases which cattle in Assam are subject to?—We can always do something like that. We want to study the diseases under local conditions. Our local conditions may differ from other Provinces. I think in a central institute we should work out the main idea, and then find out locally if there is anything acting in a secondary manner under local conditions.

26319. I suppose for our own special diseases a provincial laboratory might be necessary. But for diseases common all over India, such as the foot-and-mouth disease, rinderpest, etc., we need not undertake any research work in the Province?—I do not think so. It would be an advantage to have a laboratory for investigation of common diseases under local conditions and also of local diseases.

26320. *Sir James MacKenna:* Have you any magisterial powers to enforce segregation of cattle or the reporting of diseases?—None whatever.

26321. No Village Act in Assam?—None.

26322. Who reports cattle disease?—The head of the village or the panchayat. In the Surma Valley the village *chowkidar* reports to the Chairman of the Local Board. They are supplied with postcards for that purpose.

26323. Is it compulsory on them?—It is considered to be part of their duties, but they are very slack in doing it.

26324. I notice you complain of the delay?—There is a lot of delay.

26325. What is the cattle mortality in this Province from rinderpest?—Last year it was very heavy; it was one of our very bad years; the mortality was 30,000.

26326. Is that a particularly high figure?—Yes.

26327. What is the average for five years?—About 12,000 to 15,000.

26328. I suppose the difficulties in the way of your exercising any internal control for the prevention of contagious diseases in this Province are two. One is the infection from the wild animals in your extensive jungles; is that important?—That is not important at all; the wild animals are comparatively healthy.

26329. And of course you have a big frontier line?—Yes.

26330. Therefore, you will want a very large frontier police to exercise any control?—Very few cattle come through a great part of the frontier line. That would not be a very big item. All along the north, in the Himalayan line, practically no cattle come down. Occasionally there are a few from Manipur and the Naga Hills, and we import disease from that part.

26331. Are many elephants kept by timber merchants?—Not in such large numbers as in Burma.

26332. They are very small owners?—Yes.

26333. There is no likelihood of the animals' owners subsidising research?—None at all.

26334. In Burma they have agreed to pay Rs. 20,000 a year for five years?—We have no chance of getting anything like that.

26335. You recommend the appointment of a Superior Veterinary Officer with the Government of India. How would you work that in with the Veterinary Service as a transferred subject? There will be very few references for technical advice and for research?—There are probably very few cases, but there is no one at present to appeal to when we have differences with local authorities in our scheme for veterinary work. I think it would be an advantage to have a higher authority to appeal to when veterinary schemes are neglected or objected to by local authorities.

26336. As a final court of appeal?—Yes.

26337. And, also, do you think that would extend research work in the Provinces? Do you think it would be a stimulus for provincial officers to take to research a little more?—It would be a stimulus, yes. But speaking personally, the provincial officer has very little time for research. The departmental work and professional work take up all my time. When we get a laboratory in each Province, it would be a stimulus.

26338. Where would you post the Veterinary Adviser?—At the headquarters; at Simla or Delhi.

26339. Not at Muktesar?—I do not think so.

26340. *Prof. Gangulee:* You want a well-equipped research laboratory; if you had one, could you find time to carry on any research work yourself?—There is a lot of research waiting to be done, but I have no time to do it.

26341. If you had a research laboratory, you would want to have a research worker?—Yes.

26342. Apart from yourself?—Yes, apart from myself.

26343. You have given us a long list of diseases; what particular diseases would the research worker undertake for investigation?—There are a lot of things I want to know more about. Starting with parasitic diseases, we found a new parasite last year, which we had not suspected before; it is a parasite which attacks the pancreas; it is known in China and Burma, but we had not seen it in Assam. I want to know how it got here, what is its secondary host and things of that sort.

26344. Are you in touch with the research work done in other parts of the country?—I am in touch, through professional literature.

26345. Are you aware that a certain amount of work is being done in Madras in connection with nasal granuloma?—Yes.

26346. Have you undertaken any study of the environmental and other conditions and the incidence of disease?—Yes.

26347. You mention here a list of diseases such as bovine infectious lymphangitis, nasal granuloma, etc. Of course, we know the parasites responsible for those diseases, and we also know their life history ; but perhaps

it will be interesting to study the environmental factors that are occasionally responsible for the prevalence and spread of the disease?—I agree that it is necessary, because the local conditions may vary considerably from one Province to another.

26348. Have you undertaken any study in that direction?—Now and again, we find out that in certain districts certain diseases are more prevalent than in others in this Province, because of the local conditions of keeping the animals. In the flooded areas, when they are kept on small artificial mounds and things of that sort, certain diseases increase; whereas, if they had wider grazing grounds, the disease would take a longer time to catch hold of the animals.

26349. If you had a map of Assam before you, could you tell us which particular parts are more affected by rinderpest than others?—I think rinderpest is practically uniform all over Assam. Of course, it is much more virulent in the hill districts than in the plains districts.

26350. Have you any periodicity in the diseases?—In rinderpest there is a periodicity; every fifth or sixth year we get a much heavier outbreak and the disease seems much more virulent; we cannot account for it.

26351. You have just mentioned something, in answer to Mr. Hezlett, about local diseases; what local diseases have you in mind?—The local one is the parasitic disease which we found last year.

26352. Any new one?—That is the new one; we found it out last year; it is comparatively local to an area of two miles square. We have not found it anywhere else; it is very localised.

26353. You do not know the parasite responsible for that disease?—We know it, but we do not know the factors and the intermediary hosts; we do not know the mode of infection at all; it must be through a swamp animal like the snail.

26354. For veterinary education, you send your students to the Bengal Veterinary College; what is the arrangement you have with the Bengal Veterinary College?—A certain sum of money is provided by Government, and we send down a certain number of students. I forget what the sum is. There are six stipendiaries down there now. We give them a monthly stipend of Rs. 20.

26355. Are they all sent by Government, or are any sent by Local Boards?—At present they are all sent by Government, and there are none from the Local Boards. In previous years, there were a few Local Board students, but the Local Boards found it very expensive, because the Bengal Government put up the fee; since then, the Local Boards have sent up no men.

26356. In making a selection of these stipendiary students, what qualifications do you seek? Are they matriculates?—We try to have matriculates, but I put very much more value on a man accustomed to work with animals, who has a knowledge of animals, and who is interested in animals; if his standard of education is up to the high school standard, I would rather send him than the matriculate from the town.

26357. When they finish their studies, are they bound by any contract to serve you?—They are bound by contract to serve us for a period of five years.

26358. Do you appoint them as Inspectors?—No; we appoint them as Veterinary Assistants on probation.

26359. On what salary?—Rupees 50 a month, which is the old scale; a new scale of Rs. 55 per month has just been sanctioned.

26360. What are the duties of the Veterinary Assistants? What kind of jobs are they put on after completing their studies?—They come on the reserve at Gauhati; they work in the veterinary hospital there for some time and learn a lot about their duties, namely, the keeping of books and records and how we want them to work in connection with inoculation and general treatment.

26361. What are the duties of the Inspectors?—The inspection of dispensaries and of Veterinary Assistants' work in the field, and the checking of inoculation results; they have also other duties under the Glanders and Farcy Act.

26362. You have a Glanders and Farcy Act in the Province?—Yes.

26363. Are you able to control the disease under the provisions of the Act?—We have been able to control it so far, because the horse population is not so great.

26364. You have adequate staff for the purpose?—It is adequate for that particular disease; more staff is required for surra which comes under it.

26365. Who does the inoculation work; the Inspectors or the Veterinary Assistants?—The Assistants do the inoculation work.

26366. What is the process of castration which you have adopted? Is it the Italian process?—We have adopted the Italian process. I think Assam was the first Province to adopt this method, because I happened to be in England when the instrument was first introduced there. I brought one down with me here, and wherever we introduced it the people were keen on it. It has certain advantages; it is painless and it causes no wound, which means no dressing and no risk of contamination.

26367. You say, "Contagious diseases are often deliberately spread by *Chamars*." Is there no way of prosecuting such cases?—We have tried to do it over and over again, but it is difficult to get evidence.

26368. In this list, I find that the number of animals treated for contagious diseases is 18,000, and the number of animals treated for non-contagious diseases is 48,000; what are the chief diseases under the head 'Non-contagious'?—There are very many indeed; you can start with the ordinary ones and go on to diseases of the foot, of the digestive system, of the respiratory system and diseases in connection with calving and things of that sort.

26369. How long have you been in this Province?—About twenty years.

26370. Do you think that deaths from epidemics of contagious diseases are increasing?—I think the deaths are fewer.

26371. What interest do the local bodies take in veterinary matters?—Some of them take a good deal of interest; the Chairman takes an interest in the Veterinary Assistant's work and sees about his touring and the work generally. In some cases, they take a considerable amount of interest, but in some other cases they do not.

26372. You have to tour a great deal to inspect the work of your Assistants?—I have.

26373. *Mr. Calvert:* Are questions of animal husbandry dealt with by you or by the Agricultural Department?—By the Agricultural Department.

26374. You have nothing to do with it?—No.

26375. Do you think they should be dealt with by the Veterinary Department?—I think sometimes it would be an advantage if they were, but I have too much work to do, to do anything in connection with animal husbandry. I give them advice when they seek it at any time, but that is about all that I do.

26376. If a Livestock Expert were appointed, you would not desire that he should be put under you?—I do not think so. I have only got to do with diseases at the present moment. I control any diseases on the Government farm; I have nothing to do with animal husbandry otherwise.

26377. On the general question, do you regard officers of the Civil Veterinary Department as competent cattle-breeding experts?—I think all the officers that have been trained in England are, but I do not think that officers trained in India have very much idea about it.

26378. *Rai Bahadur R. M. Das:* Will you kindly tell me what veterinary education you had?—I was trained in Edinburgh for the diploma of the Veterinary College. I had six months' training in the University of Birmingham Laboratory, and three months' training in Tropical Medicine in London.

26379. Do you hold any degree?—I hold the degree of M.R.C.V.S.

26380. Will you please tell me whether you had any practical experience in veterinary matters in any other part of India before you joined the present post?—The only experience I had was in England and Scotland.

26381. Not in this country?—I had no experience in this country before I joined my present post.

26382. You have told us that you have been here for the last twenty years?—Yes, approximately.

26383. Do you consider the diffusion of veterinary knowledge very necessary in rural tracts?—I think it is very necessary indeed, for the improvement of the cattle and to reduce the heavy mortality.

26384. What lines do you suggest for the diffusion of veterinary knowledge in the rural tracts?—At the present time, we have Veterinary Assistants touring and treating animals in the villages. This has been our practice for the last twenty years, showing them how animals should be treated. The Veterinary Assistant advises them how sick animals should be looked after and the value of segregation in the case of infectious diseases and questions like that. To give you an example how knowledge is being diffused. A man had seen my Assistant taking blood when his cattle were ill. After some time his own cattle became sick; so he got a bit of broken glass and took a few drops of blood and came into the laboratory with it. He thought that this was an important thing to do. That is just to show how knowledge is gradually spreading even in the remotest places.

26385. What do you think of introducing lantern lectures?—I think they would be very useful indeed provided you had them on the right subject.

26386. Do you think it would be desirable to provide your touring Veterinary Assistants with lantern slides?—I should not suggest the Assistants, but I can suggest the Inspectors for doing that work.

26387. You think that if your Inspectors were provided with lantern slides they would be able to do some useful work in the way of lecturing on veterinary subjects?—I think it would make the people more interested in the subject.

26388. Have you made any suggestion to your Government to that effect?—I once suggested something to that effect but on account of financial stringency the matter was turned down. I have not done so lately.

26389. But the finances have improved since then. Do you not think that a suggestion like this would be very useful?—I have been thinking recently, again, of arranging for a certain amount of lecturing work at fairs and shows. We have a veterinary stall with specimens and some diagrams and we also show instruments there. So if we can have lanterns there also, it would be a very popular part of the show.

26390. Here is a proposal which I will read out to you. Mr. Scott, Director of Land Records, suggests, "Instead of appointing Veterinary Assistants in all places, I should recommend the starting of a certain number of qualified practitioners, with a lump sum grant sufficient to cover the initial cost of instruments and a modest dispensary building, and a diminishing stipend sufficient to maintain a practitioner in moderate comfort at first and then diminishing it to nothing at the end of five years, by which time he might have sufficient local practice to carry him on." Do you think such a proposal is feasible?—At the present time it is not feasible because the ryot would not employ the Assistant even on a small fee of 4 annas; so if you had a veterinary private practitioner he would starve. He could not live on his private practice at the present time. I do think however that in course of time (probably in the next twenty or thirty years) the local cattle-owners would be forced to come to the private practitioner for advice and assistance.

26391. *Mr. Calvert:* What happens to a man if you dismiss him?—They have tried private practice over and over again but they cannot make a living out of it; they would have to do something subsidiary.

26392. *Rai Bahadur R. M. Das:* You say that the Local Boards are unable to provide funds for the increased demands for Veterinary Assistants?—That is so.

26393. Do you think that these Veterinary Assistants should be financed by Government? What do you think of the idea of the staff being provincialised and only the cost of the dispensary building and medicine being charged to the Local Boards?—That might be one scheme. I think that if the Local Boards contribute a certain amount of money towards the cost of the Veterinary Assistant, they will probably take more interest in the man.

26394. Nowadays you charge two-thirds cost of the Veterinary Assistants to the Local Boards but they have not got sufficient funds to provide more

Veterinary Assistants whose services, you say, are very necessary and are in increasing demand. That being the case, I suggest that the Government should pay for the whole staff and Local Boards should pay for the medicine and buildings and other extra expenses?—That would be a very heavy demand on Government. I do not know if any Government would be able to pay so much for veterinary work.

26395. You consider the increase of the veterinary staff to be very necessary in the interests of the rural population?—Yes, I consider it very necessary.

26396. Then how are you going to increase the staff to meet the increasing demand?—First of all, the Local Boards must be able to pay for more men.

26397. But they have pleaded their inability to do so; they are bankrupt and are unable to pay. Do you not think that the mortality among cattle is very heavy in this Province?—It is very heavy.

26398. Then how are the Government going to meet the situation?—I cannot say.

26399. Is there any difficulty in getting a sufficient number of Veterinary Assistants now?—There has been some difficulty in getting suitable men in the past but the pay has now been raised and I think that in the future there will not be the same amount of difficulty.

26400. In order to get a sufficient number of Assistants, do you consider it desirable that a few more stipends should be granted by Government?—Yes, a few more stipends should be given.

26401. And the present number should be increased?—We give six stipends at the present time.

26402. You think that more stipends should be granted?—I think the number should be increased a little more.

26403. *Mr. Hezlett:* In addition to getting literature on veterinary subjects, you also go to Muktesar occasionally for a refresher course and you keep up your knowledge in that way?—I went to Muktesar in 1922 and I found my stay there very useful.

26404. I suppose, when you go on leave, you also keep yourself in touch with veterinary work at home?—I do.

26405. *Sir Thomas Middleton:* Could you tell me what is the percentage of recovery in case of severe attacks of rinderpest?—The mortality may vary in a severe attack from 90 to 95 per cent.

26406. So there is only a 5 per cent recovery?—Yes.

26407. What is the percentage of mortality in an ordinary attack?—In an average attack it is from 45 to 50 per cent.

26408. Have you noticed in the case of an ordinary attack that the recovery is better among the less starved animals than it is among those which are emaciated?—I think the emaciated animals have a greater chance of dying than the stronger animals.

26409. Then there is some selective effect exercised by rinderpest in the case of an ordinary attack?—I do not think it is a question of selection of disease; it is a question of the vitality of the animal.

26410. I said "selective effect"; that is to say, the percentage of recovery will be greater among the better treated animals than among the more starved animals?—I admit that the more starved animals will succumb more readily, but the mortality is still high among the well-conditioned animals.

26411. On another point. We have been discussing the question of the veterinary laboratory from the point of view of the requirements of Assam. You have been asked questions as to the diseases which you would take up. You are aware that, even in countries like Great Britain, new diseases frequently appear; for instance, we have got grass sickness in horses which is being investigated at present. Would you agree that, from the point of view of veterinary research, Assam offers almost ideal conditions for an investigator. You have got a large number of animals which, from a stockbreeder's point of view, would be regarded as being grossly mismanaged. You have a heavy rainfall, swamps and jungles; and therefore you must have any number of diseases awaiting investigation by research workers?—I think so. We have got a disease in horses which carries off a tremendous

number of them every year. The value of horses which died from this disease last year must be something like Rs. 40,000 to Rs. 50,000, and we know nothing about it.

26412. You have been working in this Province for the last 20 years, and yet I suppose you will agree with me that there must be a good number of diseases which even you do not suspect to exist in Assam but which are present in livestock?—I do not think there are very many; there may be some.

(The witness withdrew.)

Mr. J. R. CUNNINGHAM, M.A., C.I.E., Director of Public Instruction, Assam.

Replies to the Questionnaire.

QUESTION 23.—GENERAL EDUCATION.—(*a*) The existing systems of education in this Province have no direct bearing on the agricultural efficiency of the people.

(*b*) (*i*) In the elementary stages rural education in schools can have little influence on agricultural practice. The main business of primary schools is to teach children their letters; and this is a task more than sufficient for the majority of the teachers. I subjoin extracts from the last Quinquennial Review of the progress of education in Assam:—

Elementary Schools.

(1)

"In this province it is needless to attempt to make elaborate courses compulsory in their fullness and complexity. The task of teaching the simplest course is more than complex enough. Ordinarily the village schoolmaster, ill-found in vitality and learning and depressed by poverty, is in sole charge of a school of five classes or sections which he has to instruct in all the subjects of a varied course. There is no fixed date of admission. Pupils come in month by month according to caprice or the influence of their horoscopes. The lowest class, a class in which numbers are high, is a collection of little groups each at a different stage of advancement. And there are four classes above this.

"Again, with an attendance of 70 per cent on the average which sinks lower during seasons of flood and fever, the teacher is faced by a different selection of his pupils every day. Unpunctuality adds to his difficulties. In the case of rural habits, the absence of clocks and the defect of discipline, unpunctuality is the rule, the arrival of pupils being spread over a period of an hour to an hour and a half or even two hours.

"It would seem neiessary under these conditions that courses should be reduced to the elemental bone.

(2)

"What are we to teach, what are we to teach our teachers to teach, in village schools? The administrative views as regards the compulsory course favour extreme simplicity. Teach the three R's and what little else you can, but teach the three R's. For the rest, encourage the teacher's interest in subjects such as handwork which help in his work and make but little call on his energy, and discourage subjects which are and must for the present remain outside his ken. The plain man on the other hand is insistent in his demand that the course should be made practical. Children must be taught in their nonage and infancy, trades, cottage industries, hygiene, nursing, cooking, first aid, co-operation, agriculture, epidemic medicine and so forth (this is not an imaginary list). When they emerge, still in their pupilage, they will call industries from the vasty deep and will use their knowledge of all things proper to the business of life to regulate the conduct of their parents and the village elders.

"Assume these things possible with the children, it is still to be considered where we are to find the accomplished persons who are to teach them and, being found, how we can sufficiently remunerate them.

"We hear much nowadays of child psychology and the conditions of child life. It is time that we took into more equal consideration the psychology of the teacher and the conditions in which he has to work. Constantly it is found that too much is expected of the school and too little thought of the teacher."

Middle Schools.

In middle schools also but little can be done. The numbers attending such schools are insignificant compared to the main body of the agricultural population. The only course therefore which could be useful in a large way would be so to teach middle school pupils that those of them who returned to the fields would act as leaders or exemplars. But this is beyond possibility in what is still an elementary course. No more could be done than to associate instruction with labour and with field interests in such a degree as to prevent pupils on their return to the fields from being handicapped by their schooling. This would be a difficult enough achievement. It would not be an important achievement. And, if it affected adversely the cultural value of the courses for the generality of the pupils, it would be effected at a cost which could not easily be justified. For in pursuing their education beyond the primary stage the desire of pupils, or of guardians on their behalf, is to escape from the ill-found and despised existence of the cultivator.

High Schools.

By the time they have completed the middle school course pupils may have acquired a sufficient grounding in general knowledge to profit by elementary scientific instruction in agriculture were this to be included in the secondary school course. But here again only the difficulties are plain to me—

(1) Pupils are not to be found who are educated up to this stage and are willing at their own cost to undergo agricultural instruction.

(2) Teachers are not to be found who are capable of training pupils to the practice of agriculture in Assam so that they will be assured of greater success as agriculturists than if they had been associated with the land from childhood and had not gone to school at all.

(3) If the aim is to be to interest the middle classes in agriculture as farmers rather than as cottar-ploughmen, how are the pupils to find (*a*) land, (*b*) capital, (*c*) labour?

Colleges.

Before anything important can be done in schools to speed the plough, it would seem that these precedent conditions must be satisfied:—

(1) The public interested in secondary education must have been brought by persuasion or distress to the point at which they will refuse to give their children an ordinary high school education because no sort of salvation is to be found thereby.

(2) The way must have been prepared to the realisation of a larger and a more prosperous life through agriculture than is at present possible.

The first condition is on the way to being satisfied. The second may come into view as the outcome of the labours of the Commission.

We might possibly get ready for the time when schools will be asked to co-operate. Just how this is to be done is no easy matter to decide. It is not difficult of course to throw out suggestions on paper. But it is difficult to have confidence in them as practicable measures, or, even if they are well conceived, to have faith that others will have the confidence necessary to lead them to success.

Subject to these doubts, I put forward the following views for what they may be worth:—

(1) The first step must be in colleges where we must prepare the men who are to lead the new movement.

(2) Under the conditions prevailing in this country it is essential that to begin with at least the courses to be taught should be a compromise. They must lead to the issue of a degree or degrees. The degrees must qualify men for the various departments of Government service as fully as the present degrees. This should not be difficult. It would be necessary for example to concentrate on English. And—*this is crucial*—there would have to be a definite and sufficient reservation for the graduates of appointments in the executive and other branches of the public service.

Under such conditions admission to the new courses might be by competition. If a reservation of appointments were not made, the agricultural college might whistle for students. It would not get them.

The appointment of lecturers, etc., would have to be made solely with an eye to efficieny. The course would have to abjure the Dream and come down to the Business, facing the facts of the agriculture of this Province and not of another Province or another country or the world in general—the soils, the climate, the people, the flora, the pests, the economic and social conditions of Assam.

Should some such course be practicable, we should have in time a body of men interested in agriculture and knowledgeable on the subject who would be able to help in offices, in schools and on platforms when the time was ripe. At present, we have no body of men and but few individuals who are capable of giving lessons in nature study in a primary school. In our colleges the natural sciences, as distinguished from the biological, have been the only wear. Our graduates are ignorant of the simplest facts of life.

(*b*) (*iii*) I subjoin an extract from the Quinquennial Review already referred to:—

"It is to be expected that, in such circumstances, we should have a class of uncertain folk intermediate between those who do not want education and those who do. When those who do not want education are an overwhelming majority of the population, it will follow as a matter of course that those who are uncertain bulk much more largely than those who are certain As the disproportion between the masses and the elect decreases, the so-called wastage will also decrease. The problem of reducing wastage is in its main aspect no other than our old friend the problem of breaking down illiteracy.

"The uncertainties of to-day are the certainties of to-morrow. And the money spent on them is well spent in the process of pushing back the margin of educational cultivation. . . .

"This does not, of course, relieve educational authorities of the necessity for preaching the cause of education by works, doing whatever can be done by persuasion, by more efficient organisation, by improved methods and so forth to keep children longer in school and, so far as such measures can do so, to hasten the general process of conversion. But it does change what has been used as an argument for reaction and for the reduction of educational expenditure as being largely unprofitable into a very powerful argument for the increase of expenditure and the redoubling of endeavour to carry the campaign more widely afield. There is no school however stubborn in its illiteracy which does not convey some message of hope. The most backward are the outposts of progress. . . .

"It is not generally realised what an important part the economic argument plays in regulating the average duration of school life amongst the children of the poor. Briefly elementary education, even if it be free, as it is in Assam, is expensive. It costs money and brings in no return. A modest estimate of the cost of school books and materials rises from one rupee odd in class I to four or five rupees in class IV : estimates of the whole costs, including clothing and umbrellas, rise from Rs. 25 to Rs. 50 and, even if these latter estimates are excessive, yet, being halved, they still offer a formidable barrier.

"It is one thing to keep a child at school for only a single year, quite another not to send it to school at all. Many of those who have no strong faith in the value of education yet regard it as respectable to send their children to school. In good times, therefore, we should expect to see such parents keeping their children longer at school than in bad. In bad times, we should see them withdrawing their children early, and this tendency would manifest itself more strongly than the tendency to withhold them from school altogether.

"To sum up, the main reasons for wastage are the poverty and the ignorance and conservatism of the people. The remedies are time, the expansion and improvement of education, and a progressive policy in the matter of roads, railways, and economic and social development. Postulate a vigorous policy of educational advance, and every measure that conduces to the well being of the people help towards the reduction of educational wastage.

"A word in conclusion. The solution which is so frequently put forward of popularising schools by adapting rural education to rural needs has little or no meaning in the absence of an agreement as to rural needs between the rustic and the reformer. The reformer has in mind the introduction of utilitarian studies such as agriculture into the village school course. The rustic sends his child to school to learn to read and write. He has no doubt of the fact that the village *guru* knows less of agriculture than he does himself and what the boy needs in the matter of agricultural knowledge he can learn by doing in the fields . . . ."

Oral Evidence.

26413. *The Chairman:* Mr. Cunningham, you are the Director of Public Instruction in the Province of Assam?—Yes.

26414. You have provided the Commission with the note of evidence which you wish to give before us. Would you like to make any statement at this stage or shall I proceed to put a few questions?—I have no statement to make at this stage.

26415. Where are your teachers trained in this Province?—Secondary teachers are trained out of the Province, namely, in Bengal; vernacular teachers are trained in our provincial institutes.

26416. Are you satisfied with this arrangement?—No.

26417. Does this arrangement meet your demands as they exist at the moment?—I should not say so; we should be very much better off if we could afford to train our men altogether in our own institutions.

26418. Does any expense in having them trained in Bengal fall on the Province?—We pay the proportionate share of the cost of the institution in which they are trained.

26419. Is that charge a good deal less than it would be if they were trained within the borders of the Province?—Yes; it would probably cost twice as much to have them trained locally.

26420. In your note I am interested to see that you attribute a good deal of the unpunctuality of school children to the absence of clocks. On what do the rural population depend for their time? Do they depend on the sun?—Yes. If I may say so, it is not a matter of the absence of clocks in the schools so much as the absence of clocks in the home.

26421. I think you make a remark on page 146 in answer to our Question 23, which is important. There you say that a great deal has been heard about the child's psychology and the conditions of child-life but not much about the conditions in which the teachers work. I suppose a large proportion of your teachers in this Province are crippled, as it were, during the greater part of the year by ill-health on account of malaria?—Yes.

26422. Are your schools in many cases closed during the malarial season?—No.

26423. Do you think the receptive powers of the children are greatly reduced by the incidence of disease?—I am afraid I cannot answer that question. I suppose that both in the case of pupils and teachers the vitality is depressed.

26424. I thought you might have formed some view as a result of comparison between the receptive nature of the children in the hills as compared with the children lower down, where malaria is more prevalent?—The children in the plains are ordinarily quite receptive enough.

26425. I see you are quite definitely of opinion that literacy should be the objective in the primary school, and that there should be no attempt to inculcate agriculture as vocational training?—In the primary schools I think that should be definitely set aside.

26426. You do apparently see some hope that it may be possible to devise a system of middle-school education which will improve the individual as a cultivator without causing him to turn his back on the land. Such a system has not yet been discovered, has it?—I can scarcely say any hopes run high with regard to that. All I have said is that no more can be done than to associate instruction with labour and with field interests to a degree which would prevent them being handicapped. I do not think I have gone much further than that.

26427. I do not, of course, want to put words into your mouth you have not used. Do you find any tendency on the part of parents in rural areas to attribute importance and value to education for their children in so far as that education improves the value of the child as a potential cultivator?—I do not think so at all.

26428. Where the desire for education exists, it exists for education as a door to another life; is that the position?—I think so.

26429. Have you anything to tell the Commission about adult education as a possible means of inculcating literacy?—We have not done anything with regard to adult education yet in this Province, and all I know about it is what has been done in the Punjab, where I believe successful experiments have been undertaken.

26430. Do you think a large number of children in this Province who have once attained literacy lapse into illiteracy?—I do not think so, though of course large numbers who have attended school do.

26431. That is quite a different thing?—Yes. Those who have attained literacy largely maintain it.

26432. How about female education in this Province?—It is very backward indeed.

26433. The Missionaries in this part of the Province have achieved considerable success, have they not?—Yes, in the Khasi Hills female education is very much more advanced than in the plains.

26434. Is public opinion moving at all in the direction of demanding female education?—Yes, it grows very slowly. Ten or eleven years ago there was not such a thing as a girls' high school; now we have three or four. But things are moving very slowly indeed.

26435. Do you think more could be done to stimulate that movement?—It would be very difficult. I think we have got to bide our time.

26436. Let it come naturally?—Yes.

26437. You point to the inadvisability of overloading the programme of education, but is it not your view that something might be done to teach children elementary rules of health and hygiene? Perhaps it is being done in this Province?—It is being done, yes.

26438. With what result?—It is a little difficult to say. We have had teaching of that kind in force for thirty years, but I think the result is hardly noticeable. Children learn more by example than by precept.

26439. Take the example shown by the school itself. How about the cleanliness (or the reverse) of the sanitary arrangements provided in the school?—In the primary schools, there are no sanitary arrangements of any kind.

26440. Is it much use trying to teach children (who, you have just said, learn more by example than by precept) if no such rules are carried out at the school where they are being taught? What is the difficulty? Is it a question of inspection?—I think it is really a question of the faith of the people in general.

26441. I was referring to the particular difficulty of providing sanitary accommodation in schools and maintaining it in a cleanly and efficient condition?—That is quite out of the question.

26442. *Prof. Gangulee:* Are you of opinion that the voluntary system of education has failed in India?—No, by no means.

26443. Do you think the time has come for compulsory primary education?—General compulsion?

26444. Yes?—I do not.

26445. You think public opinion is not ripe for it?—I think public opinion is not ripe, and public opinion depends largely in this matter on the social and economic condition of the people. I do not think they are able to afford it.

26446. But there is a growing desire for it?—There is a growing desire for it on the part of the leaders of the people, but not, I think, on the part of the people themselves.

26447. Would you say the general public opinion of England was in favour of measures for compulsory education when they were enacted in that country?—Yes, decidedly.

26448. On page 146, in reply to Question 23, you say the first stage must be in the colleges, where you must prepare the men who are to lead the new movement. Can you explain why leaders are not forthcoming?—It is largely a matter of education. We have not men who know anything about the subjects which would require to be taught. In the Indian colleges the natural sciences have excluded the biological sciences altogether. A man who knows anything about botany or biology is rare, and when he does know anything about them he does not know about them in reference to local conditions; he has simply got up some knowledge from Western text-books.

26449. It is the deficient system of education; is it not?—Yes.

26450. What fundamental changes would you recommend in consequence in college curricula?—So far as the ordinary college curriculum is concerned, I do not know that there are any fundamental changes I would recommend.

26451. Would you introduce rural economics as a subject?—I do not think so. It is not worth while fiddling with the subject by attempting to give a mere tint of agricultural learning to the general courses.

26452. You would have special agricultural colleges for the purpose?—Yes, decidedly.

26453. In each Province?—Whether we started with one in each Province or with a central institution having affiliated institutions in each Province does not matter very much.

26454. You would not attempt to develop an agricultural outlook in the general course?—No. I think that is quite impossible until you have produced the men and the circumstances which would encourage the outlook.

26455. You say that if a reservation of appointments were not made the agricultural college might whistle for students; it would not get them. Could you specify the branches of the public service in which you think reservations might be made?—Particularly in the executive services, and in the educational; in fact, in every service for which a general training, as distinct from a professional training, was required.

26456. *Mr. Calvert:* You seem rather pessimistic about the chances of spreading rural education?—I am not pessimistic as to the possibility, but I am not very clear about the probability.

26457. Is your view based on the deficiency in the teachers?—Yes, partly.

26458. It has been represented to us that the good teacher is more important than the good curriculum?—That is so, undoubtedly.

26459. And that, if an agricultural bias has to be given to primary education, it should be given to the teacher rather than to the curriculum?—I do not think you will be able to give an agricultural bias to elementary education until elementary education becomes more general. While it is the privilege of the few, the bias is bound to be away from the fields.

26460. That is a common experience all over the world; but it is not a necessary element in education that it should be anti-rural?—No.

26461. Can you make any constructive suggestion for attaining this ideal of what every one calls a suitable type?—The only practicable suggestion is to develop education and make it more general, and to train the men who will be able to help matters forward. The people who decide to educate their children are those people who are looking away from the field, or at any rate they are educating themselves to the possibility of a turn-away from agriculture.

26462. That is to say, there is no desire for primary education for its own sake?—It is difficult to be so definite as that. There is a certain desire for primary education for its own sake.

26463. Are you able to meet all the requests for new primary schools?—No.

26464. Is the drive for extension at present coming from above, that is from you or your department, or from the people?—From the people.

26465. Have you any system here whereby your teachers attend any courses in rural economy such as settlement work and land revenue?—No.

26466. Could your teachers help the cultivators to understand the village revenue papers?—You mean the ordinary primary school teacher?

26467. Yes?—Yes; I think he could.

26468. Does he understand the methods by which, say, the land revenue is assessed?—It is difficult for me to be very definite on the point.

26469. The point I am driving at is the extent to which the teacher is a friend of the cultivator or merely an outsider thrust into the village?—Wherever possible, we try to find a teacher from among the villagers themselves. As far as possible, the men selected are appointed in their own villages, because the pay offered to them is not sufficient to enable them to live elsewhere.

26470. Because it is practically useless trying to give an agricultural bias to the curriculum if the teacher takes no interest at all in agriculture?—Yes; with inefficient teachers it is very difficult to get on.

26471. Are your teachers mostly drawn from the cultivating classes?—They are drawn from all classes.

26472. Do you make every effort to get the largest proportion from the actual agricultural classes?—No; we simply take what we can get.

26473. It is not part of your policy?—No.

26474. Can you suggest any means whereby the leakage between the first and the fourth classes could be reduced?—There are many means. You mean something sudden?

26475. You drop about 86 per cent between classes 1 and 4 and only 14 per cent survive?—Yes; general compulsion would settle the matter at a stroke, if the compulsion could be enforced.

26476. But it would not because you have not got teachers?—Yes; let me qualify that by saying "so far as we can provide teachers." For the rest, with more money generally, with better qualified teachers, with better pay, one might envisage the possibility of a modified form of compulsion. For example, one might say in a certain area, "we do not consider that you are sufficiently advanced for general compulsion"; but there is no reason why we should not introduce compulsion combined with voluntaryism, that is to say, we should say to children who go to school,

or rather to the parent, "we do not force you to send your children to school, but if you do send them they will have to stay for the full four years or five years as the case may be."

26477. Under penalty if they do not do it?—Exactly; the same penalties as in the case of the ordinary compulsory education statutes.

26478. Now, in your reports and comments do you judge your staff by the number of pupils on the rolls or by the number of pupils in the fourth class?—Neither, I think.

26479. But do you not think that you will get better results if you concentrate entirely on the number of pupils in the fourth class?—No; this would be to neglect the material which is to constitute the fourth class.

26480. But they have got to pass through the first three classes to reach the fourth class?—But if you concentrate on the fourth class, the teacher concentrates on the fourth class and he neglects the material which constitutes the fourth class.

26481. But your promotions are made subject to the Inspector's approval, are they not?—The Inspector is the general supervising authority, yes.

26482. He does actually check the promotions from class to class?—Yes.

26483. So he could check that risk?—Yes; but the pupils who need least attention are those who are most advanced and, if you concentrate the teacher's attention on them, you are spoiling your school. The pupils on whom you should concentrate most are the pupils at the bottom.

26484. You do not think there has been too much attention given to the gross total on the rolls and insufficient attention paid to the literacy?—No; we had for long in this Province a system whereby the teachers were paid according to the number of pupils in the upper classes, that is to say, the teacher would get his ordinary pay and also what is called a capitation grant, the grant increasing with the number of pupils in the higher classes; but it was quite ineffective.

26485. It was discontinued?—Yes; it bred dishonesty and did no good.

26486. The teacher again failed?—Yes; he tended to concentrate on the upper classes and to neglect the sources from which he derived his upper classes, namely, the lower classes.

26487. The main object of your primary education is literacy?—Yes; that is so.

26488. For your ten lakhs, which you say you are spending a year on primary schools for boys, do you think you are getting good value?—Yes.

26489. Is not a lot wasted on the 86 per cent who do not attain literacy?—I do not think it is a waste. It is from these pupils who do not go forward that we derive, year after year, in gradually increasing numbers, the pupils who do go forward.

26490. It is a very expensive way of achieving the object?—If we had what we could have for 10 lakhs, the total costs more, compared to the results obtained.

26491. Does your department work in close touch with the Co-operative Department?—No, not at all.

26492. Do they give lectures in your normal schools?—No.

26493. Do you insist on co-operative societies in your normal schools?—No; we tried them but without success.

26494. Have you tried anything approaching the compulsory education society of the Punjab type?—No; we got our Compulsory Education Bill passed only during the last Council Session; we have not yet framed rules under that Act, so that compulsion is not yet in force at all in this Province.

26495. In the Punjab we have a close touch between the two departments all along the line; do you not think you might get good results by some similar measures here?—I am afraid I cannot say. If I had thought so very definitely I should have moved in the matter. I do not think it is impossible that we should secure good results by co-operation between the departments; I think it is possible. But I do not just see in what way we should move.

26496. I think I am correct in saying that the Education Department in the Punjab sets a very high value on the compulsory education society which is a step towards general compulsion?—Yes.

26497. Do you think there is any hope of a similar compulsion here? —I am afraid I cannot say. We have not got compulsion introduced here at all. I am very doubtful of the value of compulsion in India, that is, the value of general compulsion in any area, so I would rather not express an opinion on the value of that.

26498. The teacher being the basis of the whole is there no way out of this *impasse?* You cannot make progress without better teachers?—No; I do not think there is; you have got to have your teachers and you have got to be able to pay them. At present we pay our primary school teachers very very poorly.

26499. But do you think the defects in the teachers are due to the fact that your salaries attract the poor class of men, or are there not good men with the necessary qualifications?—The reasons interact, I think. There is a dearth of suitable men; but if we had more money all round, more money for training, more money for teachers, more money for respectable schools, for buildings, repairs and so forth, we should have better schools.

26500. Would you mind looking at page 148 of your note? You give there three main reasons of wastage. In that paragraph you omit all mention of the teachers. Do you not think that the teacher is the chief cause of wastage?—I think it is secondary; if the people cease to be ignorant, cease to be conservative, you naturally get a different class of teachers. The teacher, if I may say so, is lurking behind this paragraph.

26501. He is the main cause?—Not a primary one; naturally if we had better teachers we should probably have less wastage.

26502. If you could get an ample supply of very good teachers, roads, railways and buildings would be less important?—Yes; that is undoubtedly so. The quality of the teacher, if I may say so, is the natural outcome of the state of progress of the people. You cannot have a backward people producing a host of capable teachers. If the people are progressive, then you may expect the teachers to be progressive also. If the people are backward and depressed, then the teacher also would be backward and depressed as a rule.

26503. For these defects in the teachers, is not the system of training of the teacher responsible?—It is really difficult to know where to begin. The system of training is not bad; our training schools are fairly good.

26504. *Sir Henry Lawrence:* What pay does the ordinary primary school teacher get?—Rs. 12.

26505. Is it fixed or varying?—There is no definite scale. Rs. 12 is the minimum; it may possibly run up to about Rs. 20; not more than that.

26506. Do you expect to get good material on that pay?—I think the pay should certainly be higher.

26507. *Mr. Calvert:* You see the results of the work of this Commission depend very largely on education?—Yes.

26508. Education depends on teachers?—Yes.

26509. If you say the material is bad and you cannot get good teachers, there is very little prospect of agricultural improvement?—Yes.

26510. But do you really think there is very little hope of any considerable improvement in the general standard of education in this Province in the immediate future?—I think there is no hope at all unless definite action of some kind is taken, unless something radical is done.

26511. *Rai Bahadur R. M. Das:* There are two kinds of education; there is education as a preparation for life such as is imparted in our schools and colleges, and, there is education the purpose of which is to train up young people to be better men. In your note are you referring to the first or the second kind of education, or to both?—Where?

26512. You say, "The existing systems of education in this Province have no direct bearing on the agricultural efficiency of the people."

Are you there referring to the first kind of education, that is, education as a preparation for life such as is imparted in our schools and colleges?—Yes.

26513. Then there is another kind of education the object of which is not to train young people for any particular occupation or profession but to be better citizens and better men?—I do not know that I would separate them.

26514. You are speaking in your note of both?—Yes.

26515. The kind of education of which I shall speak is the latter kind; that is, training people to be better men. Now you say in your note that you think the teaching of agriculturists should be associated with labour and field interests in order to turn out better agriculturists?—No, I am afraid I do not say that definitely.

26516. Yes, you have said that?—No, I merely say that it might cancel the handicap under which they would labour owing to their long absence from the fields. It is not that I deny it. I simply do not know enough to say so positively.

26517. You say, "No more could be done than to associate instruction with labour and with field interests in such a degree as to prevent pupils on their return to the fields from being handicapped by their schooling." That is what you have said?—Yes.

26518. Do you think agricultural education cannot be imparted in primary schools because the pupils are too young for such education?—Yes.

26519. And you say that is so in middle English schools because the number attending such schools is insignificant compared with the number of the agricultural population. Are you prepared to try the experiment of half-time schools so arranged that the pupils would spend a reasonable part of their time helping their parents in their work and should not lose the habit of working; I mean half-time schools which will fit in with your suggestion?—Certainly, yes.

26520. You say it can be tried?—Decidedly, yes. There is nothing in the way of its being tried now wherever people have the liking; the matter rests entirely in the hands of the Local Boards.

26521. Do you know that some Local Boards have been trying this experiment?—Where?

26522. In the Surma Valley?—There has been an experiment in Habiganj, I think.

26523. Yes. Do you know also that some Local Boards have been trying the experiment of night schools?—Yes.

26524. Do you know that the Social Service League has started some night schools which are attended by many men between the ages of 16 and 40?—Yes, mostly sweepers and people of the depressed classes I think, are not they?

26525. They are all cultivators, not sweepers, generally Mahommedans?—I did not know that.

26526. Have you received an application from the Secretary to the Social Service League asking for your help?—Yes.

26527. You have got a report about the working of these schools?—Yes, I have had some papers reach me fairly lately; I am afraid I cannot give you details about them.

26528. Are you in favour of encouraging these schools?—Decidedly.

26529. You perhaps know that many adults attend the Mahommedan *maktab* schools mainly to be taught the Koran?—Yes; but the vast majority of the pupils reading in the Koran classes of a *maktab* are of course children, boys and girls.

26530. There are also adults?—There are, but not many I should say.

26531. *Mr. Calvert:* Do you classify that as education?—Yes.

26532. Do they read the Koran or just learn the sound of the words?—They learn the Arabic alphabet, they learn their *namaz*, they learn to read from the Koran but not to translate.

26533. They cannot translate?—No.

26534. They just learn the sounds?—Yes. That of course is a mere adjunct to the ordinary primary education.

26535. *Rai Bahadur R. M. Das:* Do you think that some sort of agricultural education can be introduced in such schools?—No, none at all I think, nothing that one could call agricultural education.

26536. Do you think selected teachers in some of the primary schools can be trained in agriculture and appointed as teachers of the night schools I am speaking of on extra remuneration?—Well, there is nothing theoretically against it, but I do not quite know how it could be done. The men themselves for the most part have not got a good general education; they are generally very poorly qualified in letters and they have ordinarily, by reason of their occupation as schoolmasters, been divorced from the life of the fields for a considerable time, so that I should not think that any experiment on those lines would be hopeful.

26537. Could you pick out some teachers in primary schools who could be given sufficient training in agriculture to be teachers at the night schools where agriculture is one of the subjects to be taught?—Well, firstly, I do not think agriculture ought to be one of the subjects to be taught in the night schools, and, secondly, I think it would in practice be extraordinarily difficult to make much use of the ordinary primary school teacher to teach agriculturists their own business; I do not think he could do it.

26538. What curriculum would you suggest for the night schools?—Reading, writing and arithmetic.

26538-a. General education?—Yes.

26539. Nothing of hygiene and rural economics?—I am so impressed with the difficulties of dealing effectively with the problem in its simplest form that I would rather not personally undertake anything more ambitious to begin with.

26540. If the agriculturists attend night schools they will certainly get better education, which will make them better men, and at the same time it will not create in them an aversion to manual labour?—No.

26541. You are in favour of such education in night schools?—Yes.

26542. But you would not give any agricultural education?—Not until I saw my way more clearly.

26543. *Mr. Calvert:* By night schools you are thinking of adult education, not necessarily night schools?—Not necessarily night schools.

26544. *Rai Bahadur R. M. Das:* In the half-time adult schools you would not introduce agriculture?—I would take one step at a time.

26545. But you are in favour of half-time adult schools?—Yes, decidedly.

26546. I am sure you have read all about the People's High Schools in Sweden and Denmark?—I have read of those schools in Denmark, not in Sweden.

26547. The People's High Schools are all adult schools?—Yes.

26548. Boys below the age of seventeen are not admitted there?—There are such High Schools, I know.

26549. Do you think that similar classes can with advantage be started in this country?—No. We have got to cover a good deal of ground before we can attempt anything of the kind.

26550. *Prof. Gangulee:* That movement in Denmark rose from the people?—Really speaking from the Church.

26551. *Mr. Calvert:* And it is not vocational?—No.

26552. *Rai Bahadur R. M. Das:* The subjects taught are Swedish, German, Botany, Physics, Chemistry, Political Science and Economics. Each school is generally run by three teachers, one of whom is the headmaster who is responsible for the health and comfort of the pupils, and all the schools are residential?—Yes.

26553. Are you prepared to support schools started by the co-operative organisation with the object of imparting adult education to its members? —Yes, certainly, if it came forward with any proposal that seemed at all likely to be actually carried through.

26554. *Sir Thomas Middleton:* In answer to a previous question I think you stated that about 14 per cent of the children entering primary schools pass through standard IV and attain literacy?—I do not think I gave the percentage.

26555. Is it approximately correct?—I am afraid I could not give you the percentage. It is a comparatively small percentage.

26556. Of a hundred such boys who attain literacy by passing through standard IV, how many would proceed to a middle school?—Probably about 25; that is a guess.

26557. I only wanted a rough figure. From the middle school, how many of these 25 would go to the high school?—Say about 50 per cent.

26558. Of those who proceed to the high school how many would be expected to finish their course in the high school?—Probably about half of that again.

26559. So, taking the 14 per cent who attain literacy, we can calculate approximately the number who will ultimately matriculate after passing through the various standards?—Might I make a statement? I think there are many more than 14 per cent who actually attain literacy. That is to say, a number of pupils who could probably scarcely be described as fully literate by the time they left school, do possibly develop their knowledge a little after they leave the school.

26560. That means, more than 14 per cent attain and retain literacy?—Yes.

26561. Roughly how many?—I am afraid I could not risk any percentage.

26562. About a fifth?—No.

26563. Somewhere about 14 and 20 per cent?—Yes.

26564. Now, what is the relation between high schools and middle schools in Assam?—The high school embodies two departments, the middle school department and the matriculation department. The middle school is really a middle English school and from that point of view is an incomplete high school.

26565. May I take it that the places provided are places sufficient for the numbers who go forward?—Yes.

26566. Now, 10 lakhs are spent on primary education. How much in the middle schools and high schools?—I am afraid I cannot say offhand.

26567. I find the total expenditure on education 38 lakhs; 9 lakhs for high schools and professional schools; 10 lakhs for primary schools; the balance will be for middle schools. So that, by far the greater part of your educational expenditure is on higher institutions?—Yes; that is so.

26568. I have no doubt that by reading the Administration Reports I will get the cost per pupil in the higher institutions?—The cost per pupil is not stated in the Administration Report or in the Annual Report, but you can get it from the tables in the Quinquennial Review.

26569. On the question of the rates of teachers' pay you have already told us that a primary teacher may expect Rs. 12 to start with, and may rise to Rs. 20?—Yes.

26570. What might the middle school teacher expect to begin at and finish at in the ordinary course?—Say, Rs. 20 and Rs. 45. These are figures given offhand.

26571. I only want some indication. Then the high school teacher?—It depends very largely whether he is a Government school teacher, a Board school teacher or a private school teacher. The Government English Master begins from Rs. 75 and may run up to about Rs. 400.

26572. Is there any opportunity for the best masters in middle schools getting employment in the high schools?—Practically speaking, none.

26573. So that we have a professional group clearly marked for each of the three grades?—Yes.

26574. You point how impossible it is with the masters you have got in the primary schools and the conditions in the primary schools to do anything in the way of agricultural education. That we can agree to. In the middle school, you say little can be done, but you indicate what might be done. You say, "No more could be done than to associate instruction with labour and with field interests . . . ." If we omit labour and if we associate instruction with field interests, you do not think that the result would be sufficient to compensate for the disadvantages. You say, "It would not be an important achievement"?—Yes, may I say that the association with labour seems to me to be the central thing?

26575. You are thinking of the school farm?—Yes.

26576. At the end of that paragraph you point out that the great object in seeking middle school education is to escape from the despised existence of the cultivator?—Yes.

26577. Do you not think that the middle school might do something to alter that attitude on the part of the guardian and the pupil, and if it were possible to do anything to alter that attitude the achievement would be important?—Yes; the achievement would certainly be important.

26578. But you think the attitude could not be altered by any measures that might be taken in the middle schools?—I can only say that from my knowledge of social and other conditions in the Province, I can myself frame no proposals that would be likely to have that effect.

26579. You point out the difficulties. They are plain enough to all of us. Then, in a guarded way you put forward proposals. You say "The first step must be in colleges . . . ." There must be a step before the colleges, you have got to get the staff before you start the college course?—For the college course you want teachers, and they could be found.

26580. I myself was once in the difficult position of having to start one of the first agricultural colleges in India. My initial difficulty was the provision of material for teaching purposes; I had to frame a suitable syllabus and courses of study; it took a considerable time?—Yes; I expect so.

26581. I follow your argument and your reasoning. You say, "The courses would have to abjure the Dream and come down to the Business . . . ." I agree with that as regards agriculture. What I ask you is, would you make that statement about general education?—In what way?

26582. "Abjure the Dream and come down to the Business." What is the business of general education?—We defined it fairly lately in an Enquiry Committee, but I confess I have forgotten the precise definition we arrived at.

26583. The business, I take it, is the business of training leaders for the country; that is the main business you have got in view. It is just as true of general education as of agricultural education that you cannot get ahead until you have trained leaders?—Yes.

26584. To what extent are you successful in your effort of training leaders?—That asks for a judgment; does it not?

26585. Shall we agree that training is as difficult in general education as it is in agricultural education, on account of the absence of training in the leaders?—I should think very much more difficult in general education.

26586. On page 147, you have used a metaphor that appeals to me; you say; "The uncertainties of to-day are the certainties of to-morrow. And the money spent on them is well spent in the process of pushing back the margin of educational cultivation . . . ." If you drop the metaphor, omit the word 'educational,' and take your phrase in its literal sense, I say that we agriculturists do not push back the margin until we are assured of our market for our products?—Yes.

26587. What are the openings that you have here for your products?—That is a very difficult question. So far as secondary education is concerned, we have not got a market; we are pushing already far beyond what we have any justification for.

26588. You yourself pointed out very clearly how in agricultural education you must proceed after having first trained the leaders. It seems to me, looking at your whole expenditure on education, that you are incurring relatively a very heavy expenditure on higher education and that you are paying your primary teachers miserable salaries, and I ask myself whether it would not be a better policy to spend less on attempting to find the leaders at this stage and to spend more on securing literacy by a better treatment of your primary teachers?—Yes.

26589. I cannot think that, so long as you offer salaries of Rs. 12 rising to Rs. 20, there is much hope for bettering the village population through the teacher?—Yes. On the other hand, we cannot very well decrease the expenditure on secondary education. The only practicable course politically would be not to increase it, unduly, at the expense of primary education; that would be to allot proportionately more largely for primary education in future.

26590. *The Chairman:* You do not propose to institute an entrance examination between your primary and middle schools and between your middle and higher schools in order to limit the numbers?—We are just introducing an entrance examination or an examination at the close of the middle-school stage, but we have not yet decided that a boy shall not enter the high school unless he has passed that examination; that will probably be the next step.

26591. Is that likely to have the effect of limiting the numbers who go up?—I do not think you can reduce the numbers, but it is simply a question of preventing an unduly rapid increase.

26592. Would public opinion support any proposal to raise the standards of education?—Public opinion would certainly not support it.

26593. *Sir Thomas Middleton:* You used a striking expression in replying to one of the Chairman's questions. I do not remember the expression exactly but the gist of it was that you hoped to get from the people who did not go forward those who for the future will go forward. I asked myself, forward to what?—Here the only answer is forward to literacy.

26594. I understood that it was forward from the standard IV stage?—No, it is forward to literacy.

26595. Would you agree, then, that the important problem here is to secure an advance to the stage of literacy rather than to go forward to the higher stages of education?—I think both are immensely important. We ought to, as far as we can, devote ourselves to the general advance of education, and to an improvement in the extension of higher education.

26596. I am personally impressed with pushing back the margin of cultivation?—That is very important.

26597. But I think of the market and of the reflex effect of a glutted market upon education?—Yes.

26598. *Mr. Hezlett:* In reply to a question by the Chairman, you mentioned the fact that it was quite impossible to introduce any sanitary arrangements in the ordinary primary school; will you kindly give us your reasons for making such a statement?—I am not sure if I quite clearly understood what was meant by sanitary arrangements.

26599. *The Chairman:* I was thinking of the provision of well constructed latrines and so forth, and keeping those facilities in proper and cleanly order?—Apart from the simple fact that we find it impossible to maintain simple school buildings in decent order, the cost of sanitary latrines would be altogether out of the question. We have the more important fact that the latrines require sweepers, and they are not forthcoming.

26600. *Mr. Hezlett:* There are no sweepers in the Province, they are all imported men?—Yes.

26601. We have no sweepers in the village?—No; apart from that, we have not the money to pay for them.

26602. *Sir Henry Lawrence:* Where are they imported from?—Mostly from Bihar. Most of our sweepers, also *gowalas* and so forth come from Bihar.

26603. *Sir Thomas Middleton:* What do you have to pay them?—Considerably more than the schoolmaster.

26604. *Mr. Hezlett:* On page 146, in reply to Question 23, you hint at the fact that both the parents and guardians and our students are not quite satisfied with the present system of education?—Yes.

26605. The expression you use is "because no sort of salvation is to be found thereby"?—Yes.

26606. Do you think the time is ripe for a radical change in our policy of education?—It is more than ripe from the educational point of view but, whether it is ripe from the political point of view or not, I cannot say.

26607. You do not think, for instance, that our local Council would support Government if they declared that their policy was to convert our present Arts colleges and our present Government high schools into agricultural colleges and agricultural high schools?—No.

26608. That policy would not be supported in the Council?—No.

26609. *Dr. Hyder:* Why do you say that?—Take the science courses; the example of Great Britain, I suppose, many years ago, has led people in India as a whole to pay undue attention, as I have already stated, to physics and chemistry. Of all sciences, these are looked upon as "science" *par excellence*. The other sciences are not regarded as having the same standing or the same utility from the national point of view, but only of some utility as cultural subjects.

26610. You think the members of the Council here would not agree to the proposition that the young men of Assam should acquire a knowledge of botany with regard to tea, rice and such other useful things? Would not they be getting useful knowledge as well as general culture?—We have just obtained affiliation in botany, and I suppose the answer to that question will come when we compare the enrolment for our botany class with the enrolment for our physics and chemistry classes; there has in fact been no effective demand for botany, zoology, geology, or any other science except physics and chemistry up till the present time.

26611. *Mr. Hezlett:* A policy of giving an agricultural bias to all the schools up to the middle school might not meet with public support?—Not probably to the exclusion of the ordinary cultural courses.

26612. I notice that Government pays 75 per cent of the cost of education of a boy in an arts college and 46 per cent of the cost of education in law; does it seem right that Government should spend money educating law students when we have got too many lawyers?—I think it is inadvisable.

26613. Is there any other country in the world that pays 75 per cent for arts students?—There are such countries. May I say with regard to the Law College, that the expenditure on this college is trivial.

26614. The total expenditure is not very high?—Yes, with regard to arts colleges also, if the money spent on them were used for primary education, it would make no noticeable difference.

26615. It would not be of much effect?—No.

26616. Is the class of boy whom you would aim at selecting as a primary school teacher the ordinary cultivator's son who has passed through the primary school, gone through the middle course and then undergone normal training? He would go back to his village and take an interest in his village. Do you think it is a sound policy to try and get that type of man. He would help village life and might do some good to his village?—Certainly.

26617. *Prof. Gangulee:* Have you any proposal for raising the status of the village schoolmaster?—You can raise his status by raising his pay.

26618. Have you any proposal at the present moment before Government to raise his pay?—No.

26619. Does the village schoolmaster belong to the village or does he come from outside?—It depends upon the sub-division. In Kamrup, for example, he will ordinarily belong to the village. In the more backward sub-divisions, we have to import men from outside.

26620. Have you at any time discussed the question of agricultural education with the Department of Agriculture?—We have discussed it many times.

26621. With what result?—We discussed it mostly in connection with the recommendations of Agricultural Conferences; the result was generally negative.

26622. *Sir Thomas Middleton :* On page 146 of your note you speak about the cultural value of the courses being adversely affected?—Yes.

26623. Are you not thinking of the examination value there?—Not there, not so far as middle-school education is concerned.

26624. You mean cultural value?—Yes; if we were dealing with high-school education, it would be a different matter.

26625. *The Chairman :* Do you attach any importance to manual training in primary schools?—Not much, except where you have five classes under a single teacher who gives the children something to do in order to keep them occupied.

26626. Do you approve of the policy of compulsory primary education?—No.

26627. Is compulsory primary education about to be tried in the Province?—We passed the Act at the last Session of the Council.

26628. That is a permissive Act?—Yes.

26629. Do you expect that many local bodies will undertake the responsibility and the cost?—I think they may with reference to very limited areas if we can find money to support them.

26630. What is your main objection to the principle of compulsion?—The first objection is that the people are too poor. Education costs money and, although probably it would not be beyond the means of an ordinary cultivator even in the poorer areas to send one boy to school, it might hit him very hard if he had to send two or three boys.

26631. It is the loss of the boys' labour?—Simply on account of the cost of clothing, school-books, slates and paper.

26632. Is it proposed under your system of compulsion to finance the principal charges out of local taxation and then, apart from that, to call upon the parent to pay for the books and slates and so on?—He will also have to pay for the clothing which is the most important article.

26633. *Dr. Hyder :* Suppose he does not go to the school and works in the fields, the parent has still got to provide him with clothing?—If he goes to the fields he may ride on a buffalo and wear a loin cloth; if he goes to the school, then he wants a little *dhoti,* a little coat and probably an umbrella.

26634. Your experience is that the boys working in these marshy districts wear better clothes than the boys who look after cattle?—Decidedly.

26635. Does he not want an umbrella when it is raining and he has got to go out to the fields to work?—No.

26636. *The Chairman :* What would primary education cost if you were to have each boy educated at this moment?—It is a little difficult to say. I got out figures some years ago when I was writing the Quinquennial Review and the estimtes covering four years ran from Rs. 25 to Rs. 50; that is the total cost.

26637. For what period was that?—For four years.

26638. That would be a gradually ascending expenditure?—Yes.

26639. You say that the population is too poor to bear compulsory education. Do you think that the population of Assam is poorer than that in other parts of India?—I should think it is probably more well-to-do than the population in many other parts of India.

26640. So that, *a fortiori,* you are of opinion that no other part of India is at present capable of bearing the cost of compulsory education; is that your view?—Yes, that is my view.

26641. *Rai Bahadur R. M. Das:* Do you think that the people of the cultivating class in Sylhet are so very poor that they cannot afford the expense of sending their boys to primary schools for education?—Yes.

26642. *Sir Henry Lawrence:* Would there be any special difficulties in enforcing compulsion if it were introduced here?—I do not think there will be any special difficulties, we will not have any difficulties here which will not be felt elsewhere.

26643. Have you got the staff to enforce it?—You would have to appoint school attendance officers under the Act.

26644. Would you have any trouble with the people if parents were convicted and sentenced?—It is a little difficult to say; in some of the areas probably there would be trouble but those are not the areas in which compulsion would be introduced.

26645. *The Chairman:* Would you like to see the cost that would fall upon the parents under your proposals for compulsory education made a charge upon the public?—No.

26646. Why do you say that?—If the people are not in a position to pay for the materials required by the children for their education, I should say the country is not ready for compulsion.

26647. *Prof. Gangulee:* Your sole objection is on the ground of poverty. Have you any other objection?—The second objection is that the majority of the people at least should be persuaded to realise that education does bring some advantage before we attempt to introduce compulsion.

26648. *The Chairman:* Have you formed any view yourself as to how many years it will take to achieve literacy for, let us say, 50 per cent of the population of India under the present arrangements?—Of India as a whole?

26649. Take Assam if you like?—It will take a great many years, probably half a century.

26650. Do you think that 50 per cent in fifty years might be achieved?—Yes.

26651. *Dr. Hyder:* What is the present proportion of the children of school-going age who are being educated? How many children are there at present in the schools?—About 300,000.

26652. What is the total number of children of school-going age?—Probably about 1,600,000.

26653. And you have got at present about 300,000 children in schools?—The total population is roughly 8,000,000 and if you take 20 per cent of that to be children of school-going age it will give you about 1,600,000.

26654. How many out of these 1,600,000 are at present being instructed?—About 300,000; say, between 250,000 and 300,000.

26655. *The Chairman:* Your figure of 50 per cent in fifty years referred to the total population and not to the school-going population?—I meant literacy in the total population.

(The witness withdrew.)

Mr. W. L. SCOTT, I.C.S., Director of Land Records, Assam.

Replies to the Questionnaire.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—In this Province, agricultural indebtedness is not so pressing a problem as in Bengal. Generally, the root of indebtedness in India lies in a relatively sudden increase in the value of land held by a populace unaccustomed to the facilities for credit provided by valuable land. Over the whole of the Assam Valley, the value of land has in few areas reached a stage at which it forms a basis of credit; but that stage is now approaching. The proof of this is seen in the relatively low statistics of registration of documents both of transfer and of mortgage. The main causes of borrowing are social requirements and mortality

among plough cattle. Borrowing to buy food is not so common as in jute-growing areas. In the Surma Valley, the land mortgage is far more common and the moneylender as such does exist in fair numbers. In the Assam Valley, the usual source of credit is the Marwari shopkeeper whose interest is mainly in trade. He favours as security a lien on the crop rather than a mortgage on the land. Government has endeavoured to check any tendency for land to pass into the hands of moneylenders by inserting in all agricultural settlements made since 1919 a clause forbidding transfer to non-agriculturalists without the permission of the Deputy Commissioner. This condition of course at present applies to a very small proportion of the settled land and its ultimate effect cannot be foreseen. It has, however, operated to check transfers and also to restrict credit. Should the effect of this restriction prove favourable over a period of years it might be advisable to legislate to apply a similar restriction in the case of cultivators who cannot be protected by the terms of their lease.

QUESTION 15.—VETERINARY.—I have one suggestion to make, arising out of Question *b* (*ii*) under 15. It is impossible, it appears to me, to throw upon Government the onus of providing veterinary help in all cases in which it is required. The remedy appears to me to be in encouraging the growth of independent veterinary practitioners and something might be done to assist such practitioners in certain areas. Instead of appointing Veterinary Assistants in all places, I should recommend the starting of a certain number of qualified practitioners with a lump sum grant sufficient to cover the initial cost of instruments and a modest dispensary building, and a diminishing stipend sufficient to maintain a practitioner in moderate comfort at first, and diminishing to nothing at the end of, say, five years, by which time it might be hoped he would have gained a sufficient local practice to carry him on.

Oral Evidence.

26656. *The Chairman:* Mr. Scott, you are Director of Land Records in this Province?—Yes.

26657. Do you wish to make any statement of a general character?—No. In answer to questions in the Questionnaire I have given information on all the points which I thought could be useful.

26658. We are obliged to you for this note. You present us with a picture which is similar to that in other parts of India. Is it your view that in framing a policy designed to relieve in some degree, at any rate, the burden of indebtedness on the agricultural population, it would be of real assistance to have before you an accurate survey of the state of debt?—It would be useful, but I do not think it would be sufficiently useful to make it worth while to incur a great amount of expenditure on the matter.

26659. Is anything known about the proportion of secured to unsecured debt?—You mean the proportion of mortgaged debt to the other debt?

26660. Yes?—I do not think we have any figures; they would differ very greatly between the different parts of the Province, say, between the Surma Valley and the Assam Valley.

26661. Is the principle of non-terminable mortgage common in this Province?—I think so; I have not examined the matter in detail.

26662. Do you not think that those are facts which might very well be ascertained and correlated before any policy was decided upon?—It would be useful to know the terms of the mortgages.

26663. Have you anything which you would care to say about the law, whether All-India Statutes or Provincial Statutes, dealing with questions of debt?—No. My impression is that statutes dealing with usury have usually been a failure. I have been told by one of my Settlement Officers that the Usurious Loans Act, recently passed, has been circumvented in various ways.

26664. *Mr. Calvert:* Such as?—Addition to the capital is the obvious one, and the one most generally used.

26665. How can that circumvent the Act?—It is put in, and there is no way for the borrower to prove he did not have that amount.

26666. The court itself can frame the issue?—Yes, but the court will require evidence to hold that the amount is wrongly given.

26667. The court can itself make an inquiry into the whole transaction. How does that prevent the court from holding an inquiry?—The only evidence before the court will be the entry in the moneylender's book and the entry in the document.

26668. The entry in the moneylender's book need not be taken as accurate?—There is no other evidence.

26669. There is the evidence of the actual borrower?—I should not say that was worth much more than the evidence in the books.

26670. *The Chairman:* Have you ever considered the advisability of a system of registering and licensing moneylenders?—No.

26671. Have you interested yourself in the question of excessive fragmentation as a result of sub-division?—Yes. I have come across it as a Settlement Officer, and I have tried to get evidence of the progress or otherwise of fragmentation within the last twenty years.

26672. Do you think it is progressively increasing in this Province?—I think it must be, because the worst villages I have seen from the point of view of fragmentation, have been the oldest-settled villages in the Surma Valley. The matter has not proceeded so far in the Assam Valley, which has been opened up much more recently.

26673. Do you connect excessive fragmentation with debt?—No.

26674. You do not think it is a cause of debt?—I do not think so.

26675. You have large areas of cultivable land still unsettled in this Province?—In the Brahmaputra Valley.

26676. Have you noticed any tendency on the part of cultivators living in those villages where excessive fragmentation has taken place to move from those districts and take up land elsewhere?—It is in the thickly-settled villages that you find the worst fragmentation.

26677. Do cultivators move from such areas to tracts where there are virgin lands still to be had?—There is a great deal of movement now from Bengal to the Brahmaputra Valley, and there has been a certain amount of transfer from Sylhet and Silchar in the Surma Valley to parts of the Brahmaputra Valley, but it has not been excessive.

26678. People do not like to leave their homes?—Quite.

26679. And probably the type of cultivation on the new land is not one to which they are accustomed, would that be so?—Yes, at any rate in the case of the lands now open to cultivation. It was different forty years ago, when people from Sylhet had only to cross to Silchar to find land available for cultivation. Now they have to transfer themselves to the Brahmaputra Valley, where the work is different.

26680. Are any exact statistics in existence dealing with the facts of fragmentation in this Province?—No. I have tried to get some. We are just doing a course of resettlements in the Assam Valley. Unfortunately we have introduced a new definition of the word "field" and that has entirely obscured the actual facts of fragmentation.

26681. Do you mean it has invalidated the two series of figures for purposes of comparison?—It has invalidated them for the purpose of considering whether there is more fragmentation now than there was twenty years ago.

26682. How does it come about that you have interested yourself in the veterinary problem?—Three or four years ago I was for six months Director of Agriculture. At that time the Veterinary Department was under the Director of Agriculture, and this was one of the ideas that struck me at that time.

26683. Do you think there would be any prospects, either in this Province or anywhere else in India, for what you call independent veterinary practitioners?—I think it is an experiment that should be tried before the people become entirely pauperised by the idea that they are entitled to free veterinary help from Government.

26684. The risks of the experiment would of course fall on the young practitioners who turned their backs on Government Service for the time

and went into the districts and tried to build up a practice. How would you encourage them to take those risks?—I propose to start them off with living wage.

26685. You propose a diminishing stipend for them, commencing with a living wage?—Yes, beginning with what a veterinary man now gets from Government.

26686. *Sir Thomas Middleton:* According to the survey, you have in Assam about 41,000,000 acres. I assume that is the figure got from the topographical survey. To what extent have you got figures from the cadastral survey in Assam? What area of Assam has been surveyed?—I cannot give you the figures off-hand.

26687. I only want a very rough idea. Would there be 5 or 10 million acres surveyed and settled? The area cultivated is about 5 millions?—You will have to exclude the whole district of Sylhet, which has not been cadastrally surveyed, and most of Goalpara.

26688. Is the cadastral survey not proceeding under your direction?—No. There is a separate Survey Department which does the technical work of producing traverse outlines of all the villages.

26689. You fill up the village maps?—Yes.

26690. *Sir James MacKenna:* Is that the Survey of India?—No, the local Assam Traverse Party. As a matter of fact, the Director of the Eastern Circle of the Survey of India gets an allowance from the local Government for supervising the work, but the work is actually done by a staff paid by the local Government.

26691. You are in charge of Settlement as well as Land Records?—Yes.

26692. What is your theoretical basis of assessment here?—I have to confess we have none.

26693. No fixed proportion of gross assets?—No. We do not estimate net assets. The only rule that has been laid down is that an assessment should never exceed 20 per cent of gross assets, or one-fifth.

26694. You do not even work to one-fifth?—No, nowhere near.

26695. You are hard up in Assam, are you not?—I am not Finance Member.

26696. *Mr. Hezlett:* 11 per cent is our maximum, I think?—I am just sending up a group report to-day in which the proportion of gross assets proposed is 11·3 per cent.

26697. *Sir James MacKenna:* In Burma we take up to 50 per cent but that is on the net assets, of course. In the revision of settlements, do you give any preferential treatment in the case of improvements which have been paid for by the cultivators themselves?—Under the rules, they are exempted from enhancement for one resettlement period for improvements effected at the expense of the landowner.

26698. The period of settlement being twenty years?—It was twenty, but is now being made thirty.

26699. Are any grazing grounds reserved by Government?—In all the districts in which waste land has been available, every effort has been made to reserve large numbers of grazing grounds, available for all the people.

26700. Are they scrub jungle or grazing grounds in the strict sense of the word?—I have seen somewhere there was good grazing; on the other hand, some are full of tree jungle and reeds. They vary.

26701. Have you any provision in your land revenue rules for a systematic tillage of bad grazing ground with a view to bringing it to a state of cultivation?—No. Grazing grounds are more or less a new experiment in this Province; they were only started twenty years ago.

26702. From our experience in Burma, I should say that is a thing to leave alone. In a settlement, do you make any provision for cases where a cultivator sets aside a portion of his holding for grazing beyond the ordinary fallow remission?—In the Surma Valley, it would be classed as waste if it had not been cultivated for three years, but at the most it would have to pay one-fifth of average rice land.

26703. But that is preferential treatment?—Yes. That would be where we found a case of a man who had reserved land for grazing for at least three years.

26704. Have you a provision to that effect?—No.

26705. But the ordinary Settlement Officer would give it?—I think so, yes.

26706. And in regard to classifying land used for grazing as waste, the right of the landholder would be reserved ; he would not lose his lien on the land. It would still be inside his holding?—It would still be his land.

26707. *Prof. Gangulee :* What is your actual basis of resettlement? Can you give me the broad outlines of it?—The rule is that three years before the district falls in a report is expected from the local officers, who have to state in the first place whether from a technical point of view a resettlement is called for in order to bring the records up to date, and also whether, considering any changes which may have occurred in the district within the last resettlement period, an increase in revenue can fairly be expected, and if so, to what extent; also, whether conditions have deteriorated to any extent so as to call for a reduction or a resettlement with no enhancement but merely readjustment.

26708. For how many districts have you resettlement reports now?—Five in the Assam Valley and one in the Surma Valley practically complete, and parts of two others in each Valley. Then there are temporary settled portions in Sylhet, Goalpara and the Garo Hills; and the whole of the districts of Cachar, Lakhimpur, and a few others are temporarily settled, except for tea garden grants, large grants.

26709. What is the value of land per acre now, say, for instance, in the Assam Valley?—Anything up to Rs. 450 an acre, but I have only come across one small area in which the value is Rs. 450.

26710. And in the Surma Valley?—Unless the land is under water, you will never find the rate below Rs. 50 an acre; on the average it is round about Rs. 200 to 300 an acre; but the average in the Assam Valley would be very much lower, for there are large areas there in which the price of the cultivated land is merely the cost of clearing the land.

26711. *Sir Henry Lawrence :* Is it land on which money is being spent on improvement?—There is no improvement except the cutting down of grass or jungle growing on it and the cost will be about Rs. 5 a *bigha*.

26712. *Prof. Gangulee :* What will be the value of the land already put under cultivation?—That will be anything above the cost of clearing.

26713. Has the value increased during the last ten years?—It has increased enormously during the last twenty years.

26714. What would you say is the percentage of increase?—300 per cent; that is what has been stated, in Sibsagar, to be the rise in the value of the land since the last resettlement; the land is now worth four times what it was.

26715. *The Chairman :* It is not a question of village land or village site?—There are no village sites in this Province; the houses in villages in the plains in this Province are practically scattered round among orchards. There is hardly any question of site value in the villages.

26716. *Sir Henry Lawrence :* What provision is there to prevent improvements made by the tenant or landlord from being assessed to taxation?—It is provided in the rules that if Government allows the landholder to be let off he has got to pass it on to the tenant; but I have never come across any case of the sort you suggest.

26717. But is it possible any increase of taxation could be levied in regard to improvements made by the landholder?—Yes, at the end of the next settlement.

26718. Improvements are liable to taxation?—Yes, at the end of one settlement period.

26719. Is there provision in the *Settlement Manual* to prevent that?—No; it is laid down in the instructions that improvements are free of enhancement for one settlement period. The actual wording is: " The Settlement Officer will not ordinarily enhance the land revenue of an estate or group of estates on the ground of drainage works, irrigation works or similar improvements which have been carried out at the expense of the settlement

holder or settlement holders during the currency of the expiring settlement." That means that they are liable at the following resettlement, but not the current one.

26720. *The Chairman:* Supposing if it were made within a year of the new settlement, would that be liable to be assessed at the end of the year?—No; he would have it free for the settlement period, twenty years or thirty years as the case may be.

26721. *Mr. Calvert:* In your note you suggest, I think, that the rise in the value of land has proved a temptation to the ryots to borrow?—Yes.

26722. Have you enquired as to whether the mortgage value per acre is rising along with the rise in the value of the land?—No; I have not; not at any rate in the district of which I spoke when I said that the value of the land was rising enormously.

26723. You have not got any figures to show that the mortgage rate per acre is increasing?—No; they could be got, I think, from the Registration Office; but, in the Assam Valley, the registration of documents is very uncommon and you get very few registered documents indeed.

26724. Is it your experience that the number of moneylenders is increasing?—My experience in any one district is not long enough to say that, not within the time I was there.

26725. Have you looked into the question whether the total money lent is increasing?—No; on the basis of the increase in the value of the land I should think that the total amount of money lent must be increasing; but I have not looked into the question, I have not verified it.

26726. You refer, I think, to the tendency of restrictions on the right of alienation to restrict credit?—Yes.

26727. Have you found that such a restriction also involves any rise in the rate of interest?—I assume that it would, but I have not verified it.

Everybody assumes that it would; but we never got any fact in proof of the assumption.

26728. On this question of the Usurious Loans Act, is the opinion you express regarding the ways of getting round the Act based on experience of superior Appellate Courts or just an ordinary casual opinion?—It is merely a casual opinion. I do not know of any striking case that has been before the superior Appellate Court.

26729. Have you read Mr. Darling's book on the "Punjab Peasant"?—Yes.

26730. Speaking very roughly, would you think a similar enquiry in Assam would yield results somewhat similar?—Except in the volume of debt, yes.

26731. The volume of debt varies with the amount of credit?—Yes; I think that is the case. But the actual figures of indebtedness in Mr. Darling's book astounded me. I do not think that in this Province you will find anything like the same volume of debt expressed in rupees.

26732. Of course you have not got the same volume of prosperity?—No.

26733. If your lands are worth Rs. 200 an acre, you cannot have the same amount of debt as in the case of lands worth Rs. 1,000 an acre?—No.

26734. Otherwise you would expect to find in Assam the same general trend?—Yes.

26735. Debt does depend on the psychology of the cultivator?—You find of course far less debt in rice-growing country than in jute-growing country; that is why I said that indebtedness was not a very serious problem here as it is in other parts. My previous experience was in Eastern Bengal, in a jute-growing district, where the indebtedness was appalling; I mean part of Mymensingh. It was the indebtedness that led to the riots in 1907 and to the special measures taken by Government to establish co-operative credit societies to meet the situation.

26736. Taking Cachar which you know very well, would you say that the volume of debt varies with the mentality of the cultivator?—I think they are all very much alike; they mostly borrow as far as they can, as far as the moneylender accommodates them. The Cacharis are always in debt.

26737. Do you think a similar study for Assam would prove to be of educational value, as a basis for any policy?—It would be very interesting

26738. You do not think it necessary to concentrate attention on this problem?—It might yield useful results; that is what I can say; I have not gone into the question deeper.

26739. Could you give us any idea of debt in terms of land revenue?—No; I cannot.

26740. Taking Cachar again, have you investigated the extent of fragmentation, that is, the number of plots per ryot?—We could give you the number of plots per estate.

26741. It would not be quite the same thing though?—No; the estates are very often held in common.

26742. You have not worked out the number of separate plots per ryot at all?—That is a very difficult thing to do, because we have no figures showing the number of ryots. I can tell you the number of estates; but three estates or six estates may be made up with permutations and combinations by three brothers, let us say; A will have separate land, B will have separate land and C will have quite separate land; again A and C may have one plot, A and B another plot and so on; this is only a simple case.

26743. You have no figures showing the area of land held on *patta* by ryots?—Not per ryot; no.

26744. I gather from this Report on Cachar that there is comparatively little tendency towards what is called sub-letting; does it apply to the whole of Assam?—Yes.

26745. So practically very little of land in Assam is cultivated on terms which deter the cultivator from improving the land?—Yes.

26746. *Sir Henry Lawrence:* On the question of assessment, I suppose you have a settlement once in thirty years?—Up till now it has been twenty years; but the new system which is to come into force from 1st April next would make it thirty years.

26747. Now suppose you have a settlement which is going to expire in 1940 and a man spends Rs. 10,000 on drainage to-day, when would that improvement resulting in his land be liable to an increase of assessment?—If it is a district in which the current settlement expires in 1940, the assessment will not be enhanced in 1940, but it would be enhanced in 1960 or 1970 according to whether the next period of settlement was to be twenty or thirty years.

26748. And after that, how would you levy your increase?—We should assess according to the classification of the land as we found it. Of course the problem is not a difficult one in this Province because there is very little irrigation—practically no irrigation. The improvement that we mostly have to deal with is the making of new homesteads which often involves a great deal of work, raising of the land, planting of trees and so on; that is the improvement that we have generally to deal with. It is in the northern part of Kamrup and Darrang districts where we have much irrigation, and that is not done at any large expense to the landlord; it is simply done by the united labour of a village. We have very few cases of actual expenditure of money on improvements; just one or two.

26749. On what principle would you assess the increase?—It would be valued; the land which had been improved would be assigned to a class which would have a comparative value assigned to it as compared with other kinds of land.

26750. *Sir James MacKenna:* In other words, it would come into the ordinary settlement?—Yes, it would come under the ordinary settlement after the expiry of a complete settlement period.

26751. *Sir Henry Lawrence:* "Ordinary settlement" is a term which has no application to a great part of India; it varies in different Provinces. Does the fact that the land will be liable to assessment after the expiry of the settlement in fact discourage landlords or tenants from carrying out improvements on the land?—I do not think so; I do not think that it is ever considered.

26752. It has been alleged in some papers presented to us that it does discourage the investment of capital in land?—It is hard to prove a negative, but I do not think it has done so.

26753. *Dr. Hyder:* Would you class the bringing of waste under the plough as an improvement effected by a cultivator?—Not if it merely involves breaking up the soil or cutting down a certain amount of jungle.

26754. That is to say, it would not be an improvement effected by the cultivator?—No, I should call that cultivation, not improvement.

26755. Suppose the cultivator has got land on which he has been paying a very low rate of revenue in a district that was settled some years ago, when you make a resettlement, would you increase the rates considerably or not?—If the land remains the same or the land has been brought under cultivation?

26756. Suppose it was previously waste paying a very low rate; now it is under the plough; you say bringing the land under the plough is not improvement?—Not unless it has to be made fit for the plough, either by drainage or by irrigation. If the man has spent money in draining a marsh in order to make it cultivable, or if he has spent money in bringing water to high land otherwise uncultivable, then he has effected an improvement and we should leave him at the low rate for the next settlement period. On the other hand, if all he has done is to run his plough over land which by the grace of God has now emerged from the water and is cultivable, then we should charge him the full rate applicable to that class of land.

26757. It is referred to at paragraph 74, page 23 of your Settlement Report?—Yes.

26758. The increases are considerable, but according to this new basis which you adopted in resettling waste, of course, the effect becomes small. My only point is this that where the cultivator begins to clear the jungle from land which is in private ownership, he will have to pay at the next resettlement the higher rate applicable to the class of land; is not that so?—Yes.

26759. Apart from these two things, drainage and irrigation, which you say people do not require in this Province, the only improvement that can take place on any piece of land in Assam is the clearance of jungle?—And the making of a homestead, which is practically the only improvement which I had to deal with in the case of Cachar; there we allowed the concession by reducing the class of the *bari*; a very low rate was charged on what we call second class *bari;* we only charged that, however good the *bari* was, provided it was new.

26760. *Rai Bahadur R. M. Das:* You say in your note, "The root of indebtedness in India lies in a relatively sudden increase in the value of land held by a populace unaccustomed to the facilities for credit provided by valuable land." In the Surma Valley, do you not think that the deterioration of the productivity of the soil by intensive cultivation equally accounts for the indebtedness of the ryots?—No, I do not believe in that deterioration of the soil; I do not think such deterioration has occurred as would justify any argument that it would lead to heavy indebtedness.

26761. *Mr. Calvert:* The soil does not deteriorate by cultivation?—Rice land does not in the land that you get in the Surma Valley. I do not mean virgin soil, virgin soil will give you bumper crops for twenty years, and then it is reduced to the ordinary level of fertility below which it is not likely to fall unless you introduce a new method of cultivation or different crops.

26762. *Rai Bahadur R. M. Das:* But the greater portion of the soil in the Surma Valley is not virgin soil?—No.

26763. So that you mean to say that although it is not virgin soil and has been cultivated for centuries, there has been no deterioration of the productivity of the soil?—Not within a hundred years; it is already at its minimum, it cannot go further.

26764. You know that the greater portion of the Surma Valley has been cultivated for the last 400 years?—Yes.

26765. In spite of the intensive cultivation during the last 400 years, you mean to say there has been no deterioration of the productivity of the soil?—Not within the last century; I say it reached its minimum perhaps 300 years ago, since when it has gone on producing the same crops year after year and will do so for the next thousand years.

26766. I can tell you that in the last twenty or twenty-five years there has been a great deterioration?—I should like to know on what figures that is based.

It is what I have seen; in the last twenty-five or thirty years there has been a deterioration in the productivity of the soil; I have seen it in my village, there has been a noticeable deterioration in the productivity of the soil in the last thirty years. I can speak from at least forty years' experience in my village, but you say there has been no deterioration.

26767. In the Assam Valley, the settlement operation is in progress now?—Yes.

26768. Has each cultivator in Assam proper got sufficient agricultural pasture land for grazing purposes?—No, most of them have none; they do not keep any; there are no private grazing grounds.

26769. You say no?—No, they have none.

26770. Would you suggest to the Government that during the present settlement operations each cultivator should be assigned such land at a low rate of rent or revenue, as they call it? On condition that he kept it as grazing ground?—Yes, on condition that he kept it as grazing ground.

26771. *The Chairman:* Would you include land used for growing fodder in that question?

Rai Bahadur R. M. Das: Yes.

26772. On condition he kept it as grazing land or for growing fodder crops?—Until the people have learned to grow fodder crops it is impossible, because they will not keep the land for grazing.

26773. It could be settled at a low rate of revenue on condition that he uses it for grazing purposes?—The condition would be impossible to preserve; you would have to have a *thana* in every village to enforce it.

26774. Your *mauzadar* or *gaonbura*, or whatever you call him, would do that?—The *gaonbura* is nobody; he has got no authority in the village as a rule. The *mauzadar* is usually satisfied if he gets his revenue. You would have to have a *thana* in every village to enforce the rule. And where are you to get the land from to begin with? Over a great part of Assam, the land is very nearly as thickly settled as in the Surma Valley.

26774-a. Where possible, I say. Will you not assign some common pasture land to the villagers in certain villages?—Yes, common ground, much against my better judgment, we are assigning. Wherever land is available, land is reserved for pasture.

26775. Is it fenced?—No.

26776. How do you enforce this reservation of land for the purpose of pasture?—I will say we endeavour to enforce it. When I am on tour I often inspect pasture land to see whether the *mandal*, the *patwari* as he is called in other parts of India, is doing his duty in resisting encroachments on the pasture land, and very often I find that encroachments take place and are not reported. It is one of the most difficult things to insist upon, because generally the man who makes the encroachment is the man with the most influence in the village.

26777. It would go a great way towards the solution of the question of pasture land if you could enforce this in the case of each cultivator?—You cannot even enforce it in the case of large commons for a group of villages; it seems to me to be a hopeless task to try and enforce it for each holding.

(The witness withdrew.)

Major T. D. MURISON, D.P.H., I.M.S., Director of Public Health, Assam.

Memorandum on Rural Sanitation.*

Administration.

The Director of Public Health is the administrative head of the Public Health Department and there is an Assistant Director of Public Health to help him. The Civil Surgeons of districts are the Health Officers of their respective districts.

There is a Health Board (Epidemics) consisting of the Inspector General of Civil Hospitals and the Director of Public Health, Assam, which co-ordinates the activities of the Public Health and Medical Departments.

* Reprinted from the preliminary memorandum prepared for the Commission by the Assam Government.

All important public health projects affecting the Province are considered and reported on by the Provincial Public Health Board on which a non-official member is also represented.

Vital statistics.

Registration of vital statistics in rural areas is not compulsory. In the Cachar and Sylhet districts and in the permanently-settled areas of the Goalpara district, registration is done by Police agency. Village *chowkidars* enter the village births and deaths in *hathchitas* (village registers). The *hathchitas* are brought by them to the police stations or outposts. The entries in the *hathchitas* are copied into the police station registers and a monthly return is made to the District Civil Surgeon. In Kamrup, Darrang, Nowgong, Sibsagar and Lakhimpur and in the *khas mahal* areas of Goalpara, registration is done by revenue personnel. *Gaonburas* (village headmen) of villages keep the *hathchitas*. The *hathchitas* are submitted to *mauzadars* (revenue collectors appointed for *mauzas* or groups of villages) and copied into their registers. The *mauzadar* compiles a monthly return from the reports of the *gaonburas* and submits it to the District Civil Surgeon.

In tea estates, vital statistics are collected by garden authorities.

In the hill districts, registration is carried out only in certain parts.

Vital statistics for the Province are compiled in the office of the Director of Public Health.

All public health work in the Province is based on these statistics.

Small-pox.

To protect the rural population against small-pox, a staff of permanent public vaccinators, sufficient to visit every village in each vaccination season, which lasts from October to March, is employed by each Local Board. There is a provincial cadre of one Inspector for each district and one Sub-Inspector for each subdivision for supervising the work of vaccinators under the general supervision of the District Civil Surgeon. Vaccination operations are performed free of all charges with glycerinated vaccine lymph manufactured at the Provincial Vaccine Depôt at Shillong. Vaccination is not compulsory in rural areas. Temporary regulations making vaccination compulsory are extended to villages in which there is opposition to vaccination and small-pox is prevalent. As a result of large numbers of vaccinations being performed annually, the mortality from small-pox is very low.

Cholera.

When a cholera epidemic breaks out in a village, *chowkidars* in the Surma Valley and Goalpara and *gaonburas* in other Assam Valley districts are held responsible for reporting the outbreaks immediately by wire to the District Civil Surgeon through the District Magistrate. There are at present two mobile epidemic units, one in each Valley, consisting of three Sub-Assistant Surgeons and six disinfectant carriers who have been specially trained in cholera duty. The Director of Public Health arranges to send at once a complete unit or section of it to the affected area according to necessity. The duty of the units is to disinfect all water-supplies, inoculate all contacts with cholera vaccine and treat medically all patients. When an epidemic is severe and widespread, the Assistant Director of Public Health supervises the work of the units.

Malaria.

In order to afford relief to persons suffering from malaria, tubes each containing twenty four-grain tablets of sulphate of quinine, sufficient for the treatment of an attack of the disease, are sold to the public through the agencies of post offices and special agents such as vaccinators and *mauzadars* for six annas per tube. A printed copy of simple instructions for use of the contents and also for the personal prophylaxis of malaria is enclosed with each treatment to enable the patient to treat himself without the aid of a medical man. Quinine is also supplied free of charge from all charitable dispensaries.

In certian small areas, anti-malaria measures such as clearance of jungle, oiling of water channels and the like are being undertaken.

Kala-azar.

For *kala-azar* there is a very complete organisation throughout the Province under which treatment arrangements exist in all areas in which there is infection. Special *kala-azar* dispensaries under the control of the Public Health Department have been opened where there is no

Medical Department or Local Board dispensary in the neighbourhood. Indoor treatment is also provided in all districts and subdivisional headquarters for free treatment of those who cannot attend outdoor dispensaries on account of their physical weakness and also where there are scattered cases which a dispensary centre could not serve effectively. Outdoor cases are treated with plain antimony, a full course lasting about three months. All cases in indoor hospitals and 10 per cent of outdoor cases attending hospitals are treated with organic compounds of antimony. The latter drug has reduced the course of treatment from three months to about one month. The shorter course of treatment is being gradually extended to outdoor cases. In addition to the staff of existing Government and Local Board dispensaries treating *kala-azar* patients, 6 Assistant Surgeons and 110 Sub-Assistant Surgeons are employed by the Public Health Department for treatment and survey work. All Sub-Assistant Surgeons, whether in charge of special *kala-azar* dispensaries or State or Local Board dispensaries, visit and revisit villages within a certain radius of their respective dispensaries in search of fresh cases, and whenever they meet with a case, it is immediately brought under treatment. Regulations have been framed under the Epidemic Diseases Act (III of 1897) to compel patients to undergo a complete course of treatment, but these are rarely applied as the general policy is to persuade patients to undergo treatment voluntarily by explaining to them the benefits of treatment rather than by the infliction of punishment for non-compliance with the regulations.

Epidemics occurring in tea gardens are controlled by garden authorities.

Propaganda.

Booklets and pamphlets on *kala-azar*, cholera, small-pox and malaria, popularly illustrated and written in a conversational style showing how these diseases spread and what precautions should be taken to escape infection, are read in village schools. Magic lantern demonstrations on the above subjects are also given by the Assistant Surgeons on *kala-azar* duty when they visit villages in course of inspections of *kala-azar* institutions.

General sanitation, water-supply, conservancy and drainage.

Local Boards, of which there is one for each plains sub-division in the Province, provide villages within their jurisdiction with water-supplies by constructing public tanks or wells in suitable places. When funds are available, the local Government also make grants to Local Boards for the improvement of rural water-supplies, e.g., special grants of Rs. 3,00,000 have been made to Local Boards in 1925-26 and also in the current year. Such tanks and wells are usually fenced and provided with some sort of water-lift. There are prescribed type plans for tanks, wells, water-lifts and fencing but Local Boards have been given discretion to follow or dispense with them. Many families have in addition private tanks and wells which supply water for bathing, washing of utensils, cleansing of houses and so forth. Villages situated on the banks of rivers and streams usually draw their water-supplies from those sources.

Local Boards are responsible for the sanitation of villages under their jurisdiction. In some cases of groups of villages under the Local Board are combined into "Village Authorities." These are responsible for the sanitation of the areas under their charge and also provide water-supplies and maintain village roads. Conservancy and drainage arrangements are however very primitive or non-existent in rural areas.

Under the Public Health Department there is a Public Health Laboratory in which water-supplies and other articles of food and drink are analysed. A peripatetic sample taker is attached to the Laboratory; his duty is to collect samples of articles of food and drink from Municipalities and railway and steamer stations for analysis.

Provisions exist in the Local Self-Government and Municipal Acts for control of the sale of unsound articles of food and drink and, when necessary, the sellers are prosecuted by competent authority and such articles are immediately destroyed.

In spite of the provisions detailed above, the rural water-supply and arrangements for village sanitation are still in most areas defective and very primitive; and their future improvement must depend mainly on two factors—the provision of more funds and the spread of education.

Major T. D. Murison]

Oral Evidence.

26778. *The Chairman:* Major Murison, you are Director of Public Health in the Province of Assam?—Yes.

26779. You have provided the Commission with no written note of evidence. I understand you wish to be examined on the note under the head "Rural Sanitation" in the series of memoranda prepared for the Commission some months ago?—Yes. I wrote that note.

26780. And it has been before the Commission for some time, and we have of course had the opportunity of reading it. Do you wish to make a statement of a general character?—No.

26781. Would you just tell the Commission what your service throughout the Province consists of, what officers work under you?—There is myself who direct the operation of the Public Health Department, and I have an Assistant Director who at the present time is stationed in the Surma Valley. His duties are very largely in connection with *kala-azar;* he has to inspect a large number of *kala-azar* centres and sub-centres; he has to inspect Local Board dispensaries, which are carrying out *kala-azar* work; in addition to these, he inspects Municipalities and small towns on their ordinary sanitation work twice a year and reports on their condition; and also whenever there is a big epidemic of cholera, he supervises the operations against the disease; he collaborates with the Civil Surgeon in connection with the epidemic and organises a campaign against the disease and asks for any additional help he may require, which is given to him. These are really his principal duties. Then, in the plains districts, we have a *kala-azar* Assistant Surgeon who works directly under the Civil Surgeon of the district, and he does all the *kala-azar* work in connection with that district. At the time of an epidemic, that is to say, when we have cholera or small-pox, he is deputed to assist the Civil Surgeon in combating that outbreak. Then in each district, we have a Vaccination Inspector, and one Sub-Inspector of Vaccination for each sub-division if the district is divided into sub-divisions. Their duties are in connection with seeing the state of vaccination of the children and the adults in the villages.

26782. What grade are they?—They are styled "Inspectors of Vaccination" and "Sub-Inspectors of Vaccination".

26783. What is their training?—They generally rise from Vaccinators. Vaccinators are instructed, and if they are found competent and dependable they are selected as Inspectors and Sub-Inspectors.

26784. *Prof. Gangulee:* They have no general medical training?—They have no general medical training.

26785. *The Chairman:* The Vaccinators are the lowest rung in the system?—The last is Vaccinators, but Vaccinators are not Government servants; they are employed by the Local Boards. The Inspectors and Sub-Inspectors are under Government.

26786. You have no Public Health Act?—We have no Act.

26787. Would you advocate one?—I very strongly advocate one.

26788. Do you find that the incidence of major epidemic diseases, cholera in particular, is largely seasonal?—Yes; I think it is.

26789. Have you worked that out?—There is work to be done in that connection. There has been work done all over India in that connection and I am following that work here.

26790. Do you think that the same applies to the hill districts?—Our experience is that we have very little cholera in the hills.

26791. But when you do get it?—Since I came here we have not had any.

26792. When you do get it, do you trace it to infection from the plains?—Yes. In Shillong, we had two small outbreaks; they have been traced to Sylhet, below Cherrapunji. We have a market (Bholaganj) there and the infection came from there. The people get infected in the plains and come here, and the incubation takes place here. When they arrive here, they are admitted to isolation hospitals. If they are in their own houses or boarding houses, the infection spreads. But it is never widespread here. When we do have an outbreak we at once have very intensive anti-cholera inoculation.

26793. The water-supply of the hill tribes is good?—It is comparatively good; it is fairly free from pollution.

26794. What do you think about the drinking water-supplies of the population of the plains?—I consider them to be exceedingly bad.

26795. Do you think it is possible to improve them?—They can be improved.

26796. Is it within the economic possibilities of the situation?—Well, by the passing of the Stamp Act, a sum of three lakhs of rupees a year for three years has been promised to Local Boards for the improvement of their water-supplies. They have already had three lakhs, but I understand that has not yet been spent, because the money is not spent through the Public Health Department; it is given direct by Government to the Local Boards.

26797. That is on account of approved schemes?—They are allowed to have their own schemes; their schemes are not subject to criticism or examination by expert departments.

26798. Is that a wise arrangement?—In my opinion, it is not right.

26799. Who advises them on technical matters?—They have their own officers. Some may be qualified; others, I imagine, are not.

26800. Qualified as engineers?—Yes.

26801. What do they know about conservancy and sanitation?—I do not know.

26802. *Prof. Gangulee:* That amount of money was earmarked?—Yes, earmarked; they expected to realise a sum of ten lakhs of rupees.

26803. *The Chairman:* It was earmarked for drinking water-supply?—Yes. They introduced a Stamp Act.

26804. *Prof. Gangulee:* And that Act was to remain in force for three years?—I do not know the working of the Act; I have not a legal mind. But Government expected to realise a sum of ten lakhs of rupees, and that money was intended to be given in instalments of three lakhs of rupees for three years to Local Boards to improve their water-supplies.

26805. *The Chairman:* That was for drinking water-supplies?—Yes; that was meant for tanks and wells.

26806. Have you been consulted about that scheme at all?—We have in this Province a Public Health Board, and the Board expressed its opinion that there ought to be some provision about the manner in which this money was going to be spent, but we were informed that the Local Boards would have a free hand; they would get the money when they wanted it, and they could spend it as they liked. Subsequent to that the scheme was again sent to the Public Health Board, and we were asked to give an opinion. I, as Secretary of the Public Health Board, replied and said our opinion would not be worth the paper on which it was written, because we had already been informed that there would be no Government interference with the manner in which the money was going to be spent and when and where. It was brought to the notice of Government.

26807. So that, even if you found that a scheme were unscientific and would promote cholera, still the money would be paid?—Yes.

26808. What you have been saying does not mean that you would disapprove of a proposal to make the village or communal group responsible to carry out a scheme of hygiene and sanitation?—I do not think there would be any objection to that. On the other hand, we require legislation in order to force people to do what is right. Unless we have legislation the people will not do it, and we cannot do it. They expect Government to do everything.

26809. It is the experience in all other countries, however progressive, that you must have powers to impose standards?—We must have that power; I think that is only right. There would at the outset be some difficulties, but by a gradual process of propaganda and instruction people would take kindly to it.

26810. When people are not suffering from these epidemics they do not realise the value of these precautions?—They do not.

26811. Most people do not realise that until they are themselves attacked?—They do not realise until after they are dead.

26812. Do you see any tendency on the part of local authorities to adopt progressive schemes of sanitation, conservancy and general hygiene?—They are perfectly prepared to adopt schemes provided they are provided with the finance.

26813. There was a scheme in which they were given money, and it was not insisted upon that they should follow good advice?—That is my complaint.

I hark back to that scheme, because that seems to me to be a very extraordinary thing.

26814. Do you associate the incidence of disease in the plains districts of this Province with the problem of malnutrition?—I think malnutrition has a lot to do with it, because if people are not sufficiently nourished, it follows that their constitutions are below normal and therefore they are more readily susceptible to infection.

26815. Are you thinking of deficiency in some constituent element of diet, or are you thinking of semi-starvation as a result of under-feeding?—It is both, and it is climatic too.

26816. They are quite separate problems, are they not?—Yes.

26817. Do you think sufficient work has been done on fundamental problems of deficiency in diet and malnutrition generally?—I think a considerable amount of work has been done.

26818. Would you view with satisfaction further work in that direction?—I think it would be very desirable to find out the calory value of the various foods.

26819. *Prof. Gangulee:* What are the chief sources of drinking water in the villages, tanks or wells?—In the Surma Valley, they are mostly tanks; in the Assam Valley, we have tanks and wells.

26820. Tube wells?—No; ordinary wells, most of them *kutcha* (bad).

26821. Liable to infection?—Very much so.

26822. Have any tube wells been sunk?—I have tried very hard to introduce tube wells. After considerable difficulty, I persuaded the Chairman of the Municipality of Dibrugarh to try this as an experiment. It was tried. They got a firm in Calcutta to come and carry out the work and a tube well has been sunk. It is a well of 5 inches diameter. Water of excellent quality has been found, sufficient to supply 18,000 to 20,000 people.

26823. At what depth?—Two hundred and thirty feet, well below the level of the Brahmaputra too. Owing to some difficulties, the matter now stands there. The Chairman of that Board has been changed and another body has been elected. There was no proper agreement between the firm and the Municipality, and the Municipality would not pay the firm what they consider their due. The matter is at a standstill. Meanwhile the well is gradually going to pieces.

26824. Badly managed?—The whole thing badly managed.

26825. I find from your Administration Report that the decision of the Legislative Council to extend the operation of the Assam Court-fees and Stamps Acts for another three years made an additional Rs. 3 lakhs available in the current year and, in accordance with the recommendation of the Council, the whole of this sum has been set aside for improving the rural water-supply, and the Boards have been allowed the widest discretion in framing their plans for spending the grants made to them?—Yes.

26826. How do you distribute the amount?—It has not been distributed by the Public Health Department; it is distributed by Government. As far as I know, the Local Boards were asked to submit schemes to Government through the Commissioners of both Valleys; these schemes came before Government, and Government allotted the money accordingly.

26827. Government did not examine the schemes?—I take it they examined them.

26828. *The Chairman:* Not from the public health point of view?—No; we were told that we must not interfere. They have a free hand to use the money as they like, dig their tanks or wells where they like and when they like.

26829. *Mr. Hezlett:* I do not think it is quite correct; I am under the impression that the money was made over to the Commissioners, who allotted

it to the various Local Boards in accordance with local requirements?—I do not think so; the schemes came through the Commissioners to Government.

26830. The Commissioners distributed the sum to the Local Boards after having seen their plans?—The schemes came up to Government, and they were sent to the Public Health Board for an expression of opinion, but as we had already been told that we must not interfere, those schemes were returned.

26831. It is not interference; was any opinion expressed?—No opinion was expressed, because we were told that our opinion was not going to be acted upon.

26832. *Prof. Gangulee:* In the memorandum it is stated, "Local Boards are responsible for the sanitation of villages under their jurisdiction." Later on, reference is made to "Village Authorities"; who are these "Village Authorities"?—Under the new arrangements a group of villages is put together, and they are called "Village Authorities"; as far as I understand they elect their own little councils; it has only recently been introduced, it is a local panchayat really.

26833. Their work is not supervised by Government departments?—I should imagine their work is supervised by the Local Boards; the Local Boards delegate certain powers and responsibilities to the "Village Authorities", and they must be under the supervision of the Local Boards.

26834. What is the organisation you have for the registration of vital statistics?—In the Assam Valley it is done by *gaonburas*, who collect the vital statistics, and in the Surma Valley and Goalpara district it is done by *chowkidars;* they are the people who are responsible for collecting this information.

26835. Are you quite satisfied with the present arrangement?—No, it is very defective.

26836. Who inspects the village registers?—It goes to the local *thana;* a record is kept of the births and deaths and reported by the *gaonburas* or *chowkidars.*

26837. You have, I think, an Epidemic Diseases Act?—Yes.

26838. Do you find any difficulty in enforcing that Act?—We do not have much difficulty in enforcing the Act; at the same time, we refrain, as far as possible, from inflicting fines or punishments. We have not really yet gone to the extent of punishing anybody to that extent; we depend more on persuasion and threats.

26839. Do you find that the people of this Province are averse to vaccination?—In parts, yes.

26840. In other Provinces, we are told, they have schemes to attract medical practitioners to rural areas; have you any such scheme here?—We have no such scheme; that is a question for the Medical Department.

26841. You have a Public Health Laboratory?—Yes.

26842. What is the nature of the work done there?—We analyse and report on water-supplies and we examine and report on all the different foodstuffs.

26843. Do you have representatives of the Local Boards on the Public Health Board that you mention?—No; we have on the Board the Chief Engineer of the Province, the Inspector General of Civil Hospitals, the Director of Public Health and an Indian medical gentleman.

26844. *Mr. Calvert:* Is it true that the hill people hereabouts do not drink milk?—They do not, as a rule; the Khasis and most of the hill people do not drink milk, because they look upon it as an excretion.

26845. Does that have any deleterious effect on their general health?—I do not know that it has, because they are generally meat eaters.

26846. *Rai Bahadur R. M. Das:* Is it the case that the local Council was not at first inclined to extend the Stamp Act and the Court-Fees Act for another period of three years, unless the revenue derived from this source was earmarked for some purpose of public utility?—I understand there was something of that nature, I do not know that it existed officially.

26847. The Council insisted that the whole of the amount should be given over to Local Boards for the improvement of rural water-supply?—I think there was a promise of that nature.

26848. On that distinct understanding, these two Acts were extended by the Council for another three years?—I think so.

26849. As regards propaganda work, you say that booklets on small-pox and other diseases are periodically issued by your department?—Yes.

26850. What percentage of the population in this Province are literate?—I should imagine it is not very big.

26851. I will tell you that not more than 5 per cent or 6 per cent are literate. Do you think that by these publications, you can reach the major portion of the people for whom these pamphlets are intended?—We give them practical demonstrations; there are magic lantern demonstrations, and if they are sufficiently interested, as I know some people are, they get the contents of these booklets read to them.

26852. You say that your magic lantern demonstrations are confined only to *kala-azar?*—They are confined to the principal diseases which affect this Province.

26853. But here you have said that they are confined to *kala-azar?*—That is the one that really concerns us most; plague, which we do not have in this Province, does not enter into our propaganda work.

26854. How many Assistant Surgeons on *kala-azar* duty have you got just now?—Six.

26855. Are they working in all the districts?—They are working in the *kala-azar* infected districts.

26856. How many districts?—Six districts.

26857. They only work in the infected areas?—Yes, because it was found to be the only and the most economical way of starting propaganda work; propaganda of this nature has not been done in the Province before; it is a matter which has only been taken up in the last two years.

26858. They only touch the fringe of the population?—Yes, but it is doing something, and it is enlarging; the work is gradually growing.

26859. Do you not think that some system of well-organised propaganda work should be undertaken by Government?—It is a question of finance.

You admit 95 per cent of the people are illiterate; is it not a waste of public money to issue these pamphlets and booklets whilst 95 per cent of the population are illiterate?

Mr. Calvert : If you had 400,000 literate people, why not speak to them?

26860. *Rai Bahadur R. M. Das :* Could you suggest some such well-organised propaganda work for the rural tracts?—If you could get people to go round and lecture in the vernacular languages on various diseases, I am perfectly prepared to acknowledge that we could have a much better hygiene or public health propaganda organisation in the Province.

26861. Do you know the Sylhet Social Service League?—Yes; that is the only body of its kind in the Province.

26862. Are you in touch with the work of this League?—Yes.

26863. Do you get reports from them periodically?—I get them periodically, as to where they have been and given their demonstration lectures.

26864. Would you like to see an extension of the work of organisations like the Sylhet Social Service League?—I would welcome it gladly.

26865. Would you suggest to Government that such institutions should be encouraged and organised in other parts of the Province?—If the people would do the organising themselves.

26866. The Sylhet Social Service League has been organised. Have Government helped this League?—Yes; this year they got Rs. 500 from the discretionary grant at the disposal of the Hon'ble Minister for Local Self-Government.

26867. *Sir Thomas Middleton :* Mr. Calvert asked you about the use of milk by the Khasis; till what time does the Khasi mother suckle her infant?—As long as she is able to.

26868. What happens afterwards? The children get no milk?—They probably do not; they probably feed them on syrups and things of that sort.

26869. *Mr. Hezlett :* Is it not the practice that, when the hill mother has no milk, she chews the rice and puts it into the mouth of the child?—That is so.

26870. *Sir Thomas Middleton:* With reference to the use of sugar in jails, you give a list of common foods showing the percentage of carbo-hydrate, and you say that these common foods are not preferable or superior to sugar or its derivatives. Should you not have added "as sources of carbo-hydrate"?—That is implied; it is only a question of carbo-hydrate.

26871. That would have been implied, but you state quite definitely afterwards: "In my opinion, it is desirable that sugar or its derivatives should be used in jails;" should you not have qualified it by saying "if it is the cheapest source of carbo-hydrate"?—I do not think it is the cheapest source of carbo-hydrate; it will be more expensive.

26872. The other foods which supply carbo-hydrate also supply other things which must be given?—Yes.

26873. Are these sufficient?—I should imagine so; the jail authorities must have worked out the calorific values of these foods.

26874. I was not thinking of the calorific value; in this instance I was thinking of making up a diet with enough protein and fat?—They have probably worked it out, so that each prisoner gets a sufficiency of food with regard to the special task he is put to.

26875. If they did reduce the ration of one of these other foodstuffs they would cut out some protein?—They ought not to; they should not do it.

26876. Do you mean to say that if you cut out part of the rice you would supply prisoners with an equivalent amount of protein from some other source?—On the other hand, there may be an excess of protein.

26877. That there never is?—It may not be.

26878. *Mr. Hezlett:* Supposing Government give a Local Board Rs. 15,000 to spend on drinking wells and tanks, what particular problems do you think should be referred to your department? The first question would be where such tanks and wells should be constructed in the villages. Would your department like to interfere and say that these tanks and wells should be constructed at such and such places in the village?—Provided we have got a Public Health Engineer, it should be referred to him, because he will have great experience and a working knowledge of sanitary engineering.

26879. We have not got a Public Health Engineer in this Province; in his absence who is to decide the question of site? Do you think Local Boards have sufficient knowledge of the locality to be able to say which place is worse off for water-supply and so forth? Are they in the best position to decide the site of these tanks and wells?—They might select a site for a tank which might be an excellent one, but when they came to dig that tank they might find the ground would not hold water; that is an engineering problem.

26880. You have got no engineer in the Public Health Department who could help them?—No.

26881. So if we refer the question of site to you, you will say that you cannot pass an opinion on it?—I am concerned with the quality and quantity of water and not with the engineering problem.

26882. With regard to the question of site, the present Public Health Department cannot help the Local Boards and therefore they have got to depend on their own engineer?—Yes.

26883. Then with regard to the type of well to be sunk, which is another problem, could your department advise the Local Boards as to which type of well should be dug, whether tube well or masonry well or *kutcha* well?—Yes.

26884. Have you any staff to help the Local Boards in that way?—No, but that matter would be referred to me or to my Assistant Director.

26885. How would you advise the Local Boards as to whether a particular well should be a tube well, masonry well or ordinary *kutcha* well?—We have plans in our office.

26886. So you would be able to advise the Local Boards with regard to the type of the well?—Yes.

26887. You are generally of opinion that a local body should be controlled to a greater extent by technical authorities?—Yes; I think so.

26888. Otherwise Government money is not spent in the way that it ought to be?—Yes.

(The witness withdrew.)

Mr. MOHENDRA MOHAN LAHIRI, B.L., Pleader, Gauhati, Assam.

Replies to the Questionnaire.

Though I am a pleader by profession I have always taken considerable interest in agriculture and gardening. In fact agriculture has been my life-long hobby. For more than twenty-five years I carried on agricultural operations with six to eight ploughs and grey paddy, mustard, sugarcane, pulse, jute, etc. I imported fine varieties of paddy from Bengal. With the help of the Agricultural Department, I tried to manufacture *gur* in an improved process known as Hadi's process and also got the loan of a centrifugal machine and manufactured sugar one year. I purchased different kinds of American ploughs and also Meston ploughs on the recommendation of the department. I was an Honorary Correspondent to the Agricultural Department for a long time. I gave some attention to fruit culture and tried oranges, coconuts, pineapples of different good varieties (Kew, Queen, Sumatra), plantains, lichis. As good watermelons are not grown here, I brought some seeds from Bengal and tried the same in the Brahmaputra *chur* close to Gauhati. My vegetable garden was always very successful. My cabbages, caulis, etc., were often the biggest in this town. I always keep cows. I tried different kinds of imported varieties of milk strain. On account of advanced age, I cannot now take active interest in agriculture. I do not study any agricultural literature now and I am no longer in touch with the department. I base my replies only on my personal experience.

QUESTION 1.—RESEARCH.—There can be no doubt that this is one of the most important branches of agriculture and at the same time most difficult. Future improvement of agriculture depends on the result of research. In India, it is very difficult to find competent skilled workers and laboratory facilities for study are also very limited. By providing funds laboratory facilities may be improved, but it is not easy to secure the services of skilled workers.

In some foreign countries agriculture has developed highly and experts may be imported from there but Indian conditions are very different from these countries. I do not think that without fresh research here, the expert knowledge acquired there will be of much use to us in India. The costs of maintaining a service with foreign experts will also be very high. I believe the agricultural colleges we have in India are not fully equipped with all modern improvements. Indian students do not get their proper training to enable them to acquire knowledge which will fit them to be experts.

The only possible way is to establish agricultural colleges in India, to train up men who can afterwards take up research work successfully. Considering the vast area of India and the large number of people who depend on agriculture it is only just and proper that the expenditure of the Agricultural Department should be considerably increased. At present it is a department in name only. Unless more money is spent and more men are employed, greater facilities given for research work, the department can do no useful work.

I do not think I shall be very wrong, if I say that in India—at least in Assam, we have no agricultural experts who can render practical help to the people. Qualified agricultural chemists are wanting.

Fruit growing is always a very lucrative industry. We ought to have experts who after analysing the soil can advise people as to what kind of fruit can be grown on a particular plot of land. Instances of people wasting their money and labour by growing fruit trees on land utterly unfit for the same are very common. If before starting any fruit orchard, one can on application to the department get the help of an expert who after making necessary examination of the soil can give him proper advice he will not meet with such disappointment. I may state my own experience and cite some instance in point.

Oranges grow well in Assam. As the soil in Bengal and other neighbouring Provinces is not suitable for oranges, and as even in Assam such suitable land is very limited, an orange grove is very profitable in Assam. Orange trees live long and the maintenance charges of an orange garden are very small—almost negligible.

I therefore started a small orange garden twenty-five years ago. The trees grew well. They yielded good fruits for eight or nine years. I then opened a new orange garden on a bigger scale. In the meantime the trees of my former garden began to die and in two or three years, all the trees, about one thousand in number, died. I inspected many other gardens in this district and found on inquiries that many other new trees met with similar fate.

We ought to have experts who can ascertain the cause and suggest a remedy to stop this wholesale destruction of valuable fruit trees. In America where orange is grown extensively, in a case of this nature the owner applies for Government help, an expert is deputed who after necessary analysis and inquiries suggests remedies which successfully check the destruction, and valuable property is saved. My own theory is that the natural plant food the soil contains is all exhausted and an agricultural chemist can find out what kind of manure will have to be mixed up with the soil to make up the deficiency. A kind of insect pest known as borer also causes considerable damages to orange trees. It cuts open the bark and enters into the wood of the trees and kills it. An expert ought to be able to find out means to prevent borers attacking the trees.

In Assam, though there are plenty of mango trees, good fruits are not available. Assam mangoes are full of maggots. In some parts of Bengal also, mangoes are unfit for human use on account of similar maggots.

These facts are within the knowledge of the Agricultural Departments, but no serious attempt has been made to study the question and to make any research with a view to find out a remedy. I brought a book from America on orange cultivation but I found that conditions there are quite different, the insect pests are of different kind and the remedies tried there will be of no use here. This will also show that expert knowledge of one foreign land will not always solve the difficulties of another distant land where climatic conditions are different.

In Assam, we get only one crop of oranges during a year but, in Nagpur, the orange trees yield two crops. Whether it is possible to get two crops is worth considering. I brought some orange grafts from Nagpur through the Agricultural Department which have grown well but give only one crop.

QUESTION 2.—AGRICULTURAL EDUCATION.—There is no agricultural school in Assam. There are primary schools in rural tracts where the children of the agricultural classes as well as those of the middle classes get their elementary education. In villages, most of the middle-class people have also their own land and cultivation. The only difference is that middle-class people do not plough with their own hands but employ labourers. Both classes are therefore almost equally interested in agriculture and depend more or less on the produce of their lands. Agriculture is not taught in these schools. In Class IV, the curriculum provides under the head "Drawing and Hand Work" drawing of agricultural implements and modelling of such implements in wood with knife. This is only a farce. As the Assamese mostly live on agriculture, the primary schools in rural tracts ought to be *real agricultural* schools where boys can acquire knowledge in agriculture. The curriculam of such schools ought to include such subjects as selection and preservation of seeds, use of manure, advantageous sale of agricultural produce, taking care of cattle, making agricultural implements, mode of tilling and sowing, etc. There ought to be small farms attached to these schools where they can get some practical training in improved method of tilling. The boys can then after leaving their schools carry on their agricultural work in a better and more efficient manner than their elders. The education a boy gets at present is not only not useful, but is quite harmful, because it makes him quite unfit to be a cultivator. He leaves school with the idea that it is derogatory to do any manual work and refuses to till his own land. He is a loss to the family.

We have no competent teachers now. It will be necessary to train up teachers first. It is desirable that the teachers should be recruited from the agricultural classes. Schools will have to be established for teachers. At present there are no proper books on agricultural subjects; such books will have to be written. Up to this time no real endeavour has been made to grapple with this most important matter properly, so the beginning has to be made now.

In my opinoin, a middle-class youth cannot maintain himself by cultivating such staple crops as paddy, mustard, pulse, jute which are usually grown by an ordinary cultivator, unless he changes the existing mode of cultivation. One who employs hired labour cannot compete with one who cultivates with his own hands if both grow the same crops under similar conditions. I have taken a great deal of interest in this matter and have tried my best to ascertain by actual experiment if a middle-class youth can adopt agriculture as his only means of livelihood. With this object in view I took up land and grew paddy on a pretty large scale. I maintained eight ploughs and necessary number of bullocks and labourers. Labour then was cheaper than now. I continued the experiment for twenty years or more, and though I never suffered any loss, the margin of profit was not much. When paddy was sold at Rs. 3 per maund there was profit of about Rs. 6 per *bigha*, but when the price was lower, there was no profit. I grew sugarcane and manufactured fine *gur*, but the profit was very low. The late Mr. N. G. Mukherji, who held the office of Deputy Director of Agriculture in Bengal, and wrote a useful manual on Indian Agriculture, was also of the same opinion.

If cultivation is carried on an enlarged scale and modern improved methods and machinery be used, the case may be different; but middle-class youths cannot raise the capital necessary for such purpose.

Fruit growing will however be a profitable occupation for middle-class people. In Assam betel-nut, coconut, lichis, plantain, orange and other kinds of citrus fruits, pineapples of imported varieties (Kew, Queen, Sumatra) can be grown in abundance. The allied industry of preservation of fruits and manufacture of various valuable by-products will also be very profitable.

Agriculture can be made attractive to middle-class youths by granting land to them at special favourable rates and giving loans on easy terms to enable them to introduce improved methods of cultivation by machinery. The policy of Government, I am sorry to say, is far from sympathetic in the matter of settlement of land with middle-class men. They do not get any encouragement from Government. They are looked upon as middlemen and speculators, and, as a rule, in settling land, preference is given to actual cultivators. Recently, in some places a condition has been inserted in periodic leases granted by Government restricting the sale of land by a cultivator to a middleman. I am not unmindful of the fact that moneylenders will get an opportunity to purchase land from needy cultivators if there is no such restriction in the lease, but to protect the cultivators from the grip of the moneylenders is another matter of vast importance which ought to be dealt with differently. The mentality of young educated men of middle class, I am glad to say, has undergone a complete change for the better. They are quite willing now to take up agriculture as a career; many of them have no objection to plough with their own hands and to undertake any other manual work if they find that they can make a decent living by doing so. Many of these youths are now entering as apprentices in various European workshops (Indian workshops being very few in number) and doing the necessary manual work with pleasure. Many are disappointed in not getting admission as apprentices: they have proper education, they are quite intelligent and what is more they come with a willing heart and if we cannot guide these youths properly and they swell the number of unemployed the blame is not theirs. It is very easy to convince these educated youths about the benefits and advantages of various improved methods of cultivation and, if they adopt the same, the illiterate cultivators will also follow them. Not only will the unemployed educated youths succeed in turning out to be substantial farmers themselves, but their success will be the best means of convincing the cultivators of the advantages of improved method of agriculture.

Government can do a great deal to help these youths by granting them land and giving them loans for purchase of machinery and directing the Government experts to give them proper advice and generally to supervise their work.

The officers of the department ought always to bear in mind that they are servants of the public and that their principal duty is to advise and render all assistance to the cultivators. They ought to form the acquaintance of all leading cultivators and inspire confidence in them. They can arrange lantern lectures on agricultural subjects. In every district there

ought to be a standing agricultural committee consisting of official and non-official members who take interest in agriculture, whose duty will be to act as a sort of advisory body to the department. This committee can do a great deal to popularise the department.

It is rather difficult for a layman like myself to suggest any practical scheme and its administration and finance without any discussion with Government officials and without having proper statistics before me. I can only say that I believe with many others that the money now spent for the maintenance of the department is not money well spent. I do not blame the officers of the department most of whom try to do their difficult duty as best as they can. The department is handicapped for want of properly trained experts and also for want of funds. It is a neglected department. The expenditure of the department ought to be very considerably increased to make it efficient and useful.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—In every important centre, a demonstration farm ought to be established; the officers in charge of the farm ought to see all the leading cultivators of the locality and explain to them the improved methods adopted by them and if they find that the produce of the farm is much larger than theirs, I see no reason why they will not be convinced. The middle-class educated youths who with Government help introduce improved methods may also help in this matter. It may be made a condition of the help they get from Government that they will have to do propaganda work like this.

QUESTION 4.—ADMINISTRATION.—The services afforded by the department are not satisfactory. They have not been able to inspire confidence in the public. There is want of competent experts, who can render any practical assistance. Agricultural committees as proposed by me will be useful.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(*a*) In Assam, cultivators mainly depend on the paddy and when that fails, they have to borrow; during the ploughing season a bullock dies, falls ill or is killed by tiger; during the progress of cultivation he finds that his stock of paddy which he thought would carry him to the end of the season, is used up. On these occasions he borrows and on any terms he secures a loan. He agrees to give eight maunds of paddy as hire of the bullock and half the quantity of paddy borrowed by him as interest. Marwari traders and village moneylenders lend the money. If the crop is sufficient, he can repay but otherwise he cannot pay off his debts.

(*b*) Co-operative credit societies ought to be able to lighten the burden of debt. Money ought to be lent to an agriculturist on the mortgage of his land—the amount to be repayable by instalments extending over long periods—ten to twenty years. In this connection, I am glad to state that on the initiation of the present Director of Agriculture, a co-operative land mortgage bank has been established in Kamrup district with a view to enable small landowners to save their lands which are heavily mortgaged. I am one of the Directors of the bank and I entertain great hope about the future usefulness of the bank. Such banks ought to be established in all important centres.

(*c*) I am not in favour of limiting the right of cultivators to their lands by restricting their power of sale and mortgage. It will reduce the value of the lands. The existing law allows the civil courts to interfere when the interest is high and unconscionable.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—I am afraid that according to the Hindu and Mahommedan laws of succession fragmentation of holdings is inevitable. I do not see how, without changing the law of succession, which is out of the question, it is possible to prevent subdivision of holdings. When a cultivator on succession gets a small piece of land not sufficient for his maintenance, he acquires other land and in this way holdings are often consolidated. Necessity compels a cultivator to consolidate his holding by purchase or exchange.

(*c*) I do not think that the suggested legislation is necessary. It is no doubt desirable to keep disputes out of court, but no country has succeeded in doing it.

QUESTION 8.—IRRIGATION.—In Assam—at least in Kamrup—I am not aware of Government having taken up any irrigation scheme in hand. There are big rivers and also many small hill streams. It is certainly

possible to utilise some of these for irrigation purposes. There are instances however of cultivators combining and digging long canals to irrigate their own land also putting *bunds* (embankments) in small streams for that purpose. In such cases as the land is improved, Government charge higher rent for it; in other words, instead of encouraging such enterprise, an extra tax is charged on the labour of the ryots. This does not seem to me to be at all equitable. Nature is very kind in Assam. There is plenty of rain. Tanks, ponds and wells, though needed for drinking water, are not required for agricultural purposes.

QUESTION 10.—FERTILISERS.—The cultivators generally do not even use their own cowdung. Sometimes they sell it to neighbouring tea planters and sometimes other people take it away without paying anything. It will be difficult to induce people to purchase manure when they do not use their own. As they grow only one crop in the year, manure is perhaps of not such importance to them.

QUESTION 11.—CROPS.—The department I believe is making investigations to find out the most heavy yielding variety of paddy. *Indrasail* paddy of Bengal is distributed by the department and, so far as my experience goes, it is a suitable variety.

The principal crop in Assam is paddy which may be divided into three main groups:—

(1) Transplanted paddy.
(2) *Bao*—which is sown broadcast on land which goes under water during the rains.
(3) *Aus*—which is sown on high lands.

The first one is the most important as it is grown more extensively than the other two.

Practical experience of ages is a great asset to the cultivators and I believe they know very well how to grow this staple crop. Except in the matter of selection of seeds and the use of manure, very little can be done to help them in improving this crop.

It takes six or seven months to grow and reap the paddy and during this period the cultivators tend their cattle but, as soon as paddy is harvested, they let loose their cattle which graze freely. The result is that those among them who intend to grow any other crop cannot do so unless they fence round their land which will involve considerable labour and cost. In other words, a ryot cannot make profitable use of his land because his neighbours do not look after their cattle. I think this practice is greatly responsible for Assam ryots not growing a second crop on their land.

Some ryots grow mustard, jute, sugarcane, pulse, on a very small scale generally for their own use. There is room for extending their cultivations. Immigrants from Mymensingh and other neighbouring districts of Bengal, mostly Mahommedans, have now been settling in Assam and they have been growing jute and other crops on an extensive scale. They are hard-working and as the prices of all agricultural produces have gone up they are getting rich and trying to invest their money in the purchase of land from their Assamese neighbours. There is a great future for the jute industry in Assam. Wild animals cause considerable damage to the crops and cattle are also often killed by tigers. Licences for guns ought to be granted to the cultivators more liberally.

QUESTION 12.—CULTIVATION.—The old primitive Indian plough is often the subject of ridicule. We nowadays hear of improved ploughs and scientific agriculture. As far as I know, however, nobody has yet found out a plough which can be the substitute for this simple plough which can be used by the cultivators in mud and water to prepare land for transplanting paddy. The improved American plough and other ploughs may be used in tilling high land or low land when dry but they are quite unsuitable for land on which paddy is transplanted—the main object in such case being to mix up earth with water and to prepare deep mud. This is the reason why this traditional Indian plough still holds its ground. I tried some improved types of American plough but found my Assamese cattle too small and weak for them. The Meston plough is smaller and some attempt has been made by the department to introduce it but it has not been successful. These improved ploughs may be worked with buffaloes in tilling high land but Assamese cultivators generally prefer cattle to buffaloes for various reasons.

A small motor plough of the type of Indian plough which can be worked by one man may be useful to open high land but I think the cost of liquid fuel will be more than the food of a pair of buffaloes and the initial cost of purchasing it will be beyond the means of an ordinary cultivator. Motor ploughs and tractors may be used by middle-class men if trained men to drive them or to teach others to drive them are available.

QUESTION 14.—IMPLEMENTS.—My idea is that an Assamese cultivator, if he is convinced that improved agricultural implements will increase his crops, will go in for them if the prices are not beyond his means. The use of improved sugarcane-pressing machine may be cited as an instance. Formerly the cultivators used a crude wooden crusher. Some manufacturers let out their iron sugarcane-crushers on hire and the cultivators now use them in preference to their crude machines. Well-to-do cultivators now purchase these improved sugarcane-crushers and let them out on hire to their poorer neighbours. Machinery will be too costly for individual cultivators. Unless a proper type of improved plough suiting the requirements of a poor Indian cultivator can be devised and machinery suiting Indian conditions can be manufactured, I see no chance of any improvement in this matter.

Co-operative societies under the supervision of the department may be formed to purchase implements which suit the Indian cultivators and these may be let out on hire just in the same way as the sugarcane-crushers. Thus with the help of these societies improved implements may be introduced. The department however will have first to prove the efficiency of the machinery and other implements by actual demonstration. Landholders and well-to-do middle-class people who own land may be quite willing to purchase such machinery and carry on agriculture on a large scale if it is profitable to do so. They must however be assured of the real usefulness of the machinery. They cannot undertake the risk of purchasing costly machinery for mere experiment. One gentleman here has purchased a tractor for his son by actually borrowing the money, but the boy has not been able to work it properly. Others also here have tried tractors without success. These failures seriously retard the introduction of new machinery.

QUESTION 15.—VETERINARY.—The Civil Veterinary Department ought to be a branch of the Agricultural Department and placed under the Director of Agriculture. There are very few veterinary dispensaries in Assam and people have no faith in the efficacy of treatment there. Assamese cultivators spend very little for their own medical treatment and it can hardly be expected that they will do more for their cattle. With the spread of education, people will learn to appreciate the usefulness of these institutions.

QUESTION 16.—ANIMAL HUSBANDRY.—Assam cattle are poor in size and strength. The cows give very little milk—generally not even half a seer. Climate may have something to do in the matter. I have tried different kinds of cows and they have proved more or less unsatisfactory. Multan cows give much less milk here and within my knowledge three or four of them became barren after giving three or four calves each. Bullocks for carts have all to be imported from Bihar and good plough bullocks are also imported. The price of imported cattle is very high, so it is absolutely necessary to improve the breed of plough cattle as well as milch cows. Assamese cultivators do not plough with bulls. They castrate the young bulls by a crude painful process when they are three or four years' old and as they do not keep any bull for breeding purposes, the calves are progenies of these young and immature bulls. It is therefore necessary to import suitable bulls. Considering the apathy of the cultivators in this matter, it is the duty of Government and Local Boards and Municipalities to keep sufficient number of bulls. I understand that near Gauhati a Government farm for breeding purposes will be soon opened. There is also a Government Dairy Farm at Shillong but the bulls and heifers of this farm cannot stand the hot climate of the plains. I got three heifers from this farm two of which died. The department by careful inquiries ought to find out the variety best suited for Assam. Bulls of big size will not suit. Assamese cultivators take very little care of their cattle. They make some arrangement to feed their plough bullocks when actually employed in ploughing but generally the cattle are let loose and are supposed to take care of themselves. The cattle sheds are not kept properly. The floor is often full of holes where urine accumulates and it is a pitiable sight to see cattle in such sheds.

DAIRY.—It is difficult to get good milk. Price is very high. Nepalese graze buffaloes in jungles and supply milk and *ghi* but though the prices of these articles are very high, they are not prospering. The grazing tax realised by Government—3 rupees per buffalo and 6 annas per cow—seems to be very high and is to a great extent responsible for the depression in their trade and the poor supply. Government recently proposed more stringent rules and their wider application, but on account of public opposition they were dropped. The policy of Government does not seem to be wise. Instead of encouraging people to open dairies, Government is trying to put obstacles in their way by trying to increase grazing tax. Fodder shortage is most marked from December to March. The cattle look quite lean and famished and when, after early rains in April, grass grows they begin to thrive and in June they look quite healthy. If fodder is grown in Government reserves, people may be allowed to use it on payment of small fees.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—In Assam, women do considerable agricultural work which is not done by women of other Provinces. They go to the fields, transplant paddy and reap it; they also do household work and weave cloth; they keep goats, rear poultry and silk worms and do lots of other useful work. The male persons plough land, collect fuel, thatching grass, repair their homes and have sufficient work for some nine months in the year. A good cultivator tries to grow everything required for his own household, but just sufficient for his own purpose and not more. He has sufficient knowledge of these industries and there is considerable room for expansion and improvement. His standard of living being low, his wants are very few so it is difficult to induce him to resort to these industries in a bigger scale. It is necessary to raise the cultivator's standard of living first.

People are always reluctant to introduce any change but I am sure that with vigorous attempt to demonstrate the advantages of improved looms and agricultural implements they will gradually adopt them.

I have some experience of rice hulling industry as I have started a small rice mill which is managed by my sons. There are about one dozen such mills in this district. These mills have not been able to attract Assamese labour. The railway companies, steamer companies, tea gardens and other industries have all to depend on imported labour. Assamese cultivators are averse to any such hard work.

I believe, however, that people will take part in many industrial enterprises if they have personal interest in them. I, therefore, suggest the following scheme which I think will turn an agricultural centre into an industrial centre also. In an important paddy centre a co-operative rice mill factory under Government supervision can be started where all cultivators can husk the paddy required for their own use and also any surplus which they want to sell. In that case, they will be able to sell rice instead of paddy at an extra profit. They will be able to repay the money they borrow from the profits of the mill. Along with rice mill there may be oil mill and sugarcane-crushing mill which can be all worked by the same engine in the same factory. The villagers will be able to crush their sugarcane and mustard in these mills and sell the finished products at higher prices—neighbouring cultivators will also be allowed the use of these mills on reasonable terms. The sale of agricultural produce through middlemen will be avoided and all profits of the mills which now go to the pockets of some rich and enterprising men will go to the growers themselves. The primitive *dhenki* with which they husk paddy now and crude sugarcane-crushers and oil pressing machines will be entirely eliminated. It is an experiment worth trying and its success will improve the condition of the agricultural classes greatly.

QUESTION 19.—FORESTS.—Assam is said to be a land of jungles but it is a curious fact that we have to purchase jungles here at an exorbitant price. Thatching grass or reeds which grow wild in the *churs* of the Brahmaputra are sold at such high prices that people here consider it much cheaper in the long run to build houses with corrugated iron sheets. Wood fuel is so dear that in the town of Gauhati many people are using coke. Scarcity of labour seems to be the main cause.

QUESTION 20.—MARKETING.—Paddy and mustard are exported from Assam mostly by Marwari traders. They mostly purchase direct from the growers. As many rice mills are started now in this district the cultivators

can easily arrange to sell their paddy direct to the mill owners. If under Government supervision and aid, co-operative societies are started the cultivators can, with the help of the societies, sell their surplus paddy and other agricultural produce direct to the purchasers.

Societies will have godowns in suitable places and when a cultivator is in need of money, he can carry his stock to the nearest godown and take some money as advance and after the disposal of the grain collected in a godown accounts may be finally adjusted. The societies can deal direct with the mills and other purchasers.

QUESTION 22.—CO-OPERATION.—There is a vast field for expansion of all kinds of co-operative societies in India. In the present state of things when suitable men are not available the societies ought to be under Government supervision. Purchase societies are almost unknown in Assam. I think such societies will be very useful if the main object be to help the poorer cultivators to sell their surplus grains at proper prices and to save them from the moneylenders.

Oral Evidence.

26889. *The Chairman:* Mr. Lahiri, you are a pleader from Gauhati?—Yes.

26890. You have provided my colleagues and myself with a very interesting and very full note on the points which you wish to lay before the Commission and I will proceed to ask you one or two questions?—If I had had time, I should probably have written a better note; I was in a hurry and so could not do full justice to it.

26891. I think it is a very good note, if I may say so. In the opening paragraphs you suggest that a better service might be provided by the Agricultural Department. Do you think it might cost more than the present service?—It will cost much more than the present service.

26892. Do you suggest that the funds for the better service should be found by allotting a larger proportion of the existing revenues to agricultural purposes or by an enhancement of taxation, or by both?—Probably by both.

26893. Do you think that the Province could stand an increase in taxation?—I think so, if the money is earmarked for agricultural improvement and is really well spent.

26894. You give us a very interesting account of your own wide experience in farming. Have you any experience of potato growing?—I have tried it but that is not worth mentioning.

26895. It is a very important part of the cultivation in these hills; is it not?—Yes.

26896. I see on page 180 you say "The officers of the department (that is the Agricultural Department) ought always to bear in mind that they are servants of the public and that their principal duty is to advise and render all assistance to the cultivators." No doubt all officers of Government have to remember that they are paid to be public servants, but do you suggest that there has been default in that respect?—The cultivators do not know them and probably they are to blame for it and not the cultivators. It is the duty of Government servants to seek the people, advise them and let them know that they exist for their benefit.

26897. You feel that there is need for a progressive policy in research and administration and you think that, provided the cultivator is assured of a reasonably substantial return, he will not prove to be over-conservative?—That is my impression.

26898. I am very much interested in your experience in the matter of animal husbandry. On page 183 of your note, you say that you have in your day kept a dairy herd and have tried various strains of cows. Could you tell us quite briefly what strains you have tried?—I only kept some cows for my own house.

26899. I did not mean on a commercial scale. What breeds have you tried?—I tried the Multan breed; I also took some heifers from Shillong which are known as Taylor's breed; they come from Patna.

26900. I wonder whether you have yourself imported animals from other Provinces?—I brought some from Serajgunj in Bengal. A gentleman also got some cows but somehow or other they did not prove successful.

26901. Where did they come from?—They came from Patna.

26902. Did you get any progeny from that stock?—That stock was an entire failure.

26903. Did they all die before they could have any calves?—Yes.

26904. You cannot from your experience say definitely that the stock deteriorates as a result of importation into the Province?—I have said in my note that the Multan breed does deteriorate. The Multan cows that I had gave less milk here than in other parts of India, and after giving three or four calves some of them became barren.

26905. *Sir Henry Lawrence :* Are you making that statement from your personal experience, did you know the milk record of those particular cows before they came into this Province?—That I cannot guarantee.

26906. It is very important to discover, if possible, whether there are environmental conditions in the Province which are to a greater or less degree inimical to the health and life of the cow?—Several gentlemen from Gauhati brought Multan cows from Patna and other places; some purchased them from *melas.*

26907. *Prof. Gangulee :* From what market did you buy your Multan cow?—It was brought by a European gentleman and I purchased it from him.

26908. *Sir Henry Lawrence :* What became of these calves of the Multan cows; did you rear them?—Some of them died and some of them are living still.

26909. Are they giving good milk?—They are not as good milkers as their mothers were.

26910. Who was their father?—It was not really a Multan bull; they are not available here.

26911. With what kind of fodder did you feed your Multan cow?—The best that I could get in Gauhati.

26912. What was its breed?—It was of mixed breed; she was a little bigger in size than the ordinary cow.

26913. How did you get these Multan cows; were they brought round to your farm by some travelling seller or what?—The cow that I had was brought by a European gentleman and I purchased it from him.

26914. How much did you pay for that cow?—I paid about Rs. 200 for the cow and two calves.

26915. How old was the cow?—I was told that she had only given birth to two or three calves.

26916. *Sir Thomas Middleton :* You say that it is desirable that teachers should be recruited from the agricultural classes. We have been told that when men are taken from the agricultural classes and become teachers they despise agriculture; is that your experience?—At present we cannot have agricultural teachers unless we train them; no beginning has been made yet. We have no books, we have no teachers and no proper schools. That is my own impression.

26917. You are one of those who do not despise agriculture but we are told that most educated people in Assam do despise it?—That was the mentality before, but I think many educated young people are now quite willing to take up agriculture as a career.

26918. You have shown a good example but other people have not followed it?—I have not been very successful.

26919. *The Chairman :* You have done your best?—Yes; but I have not been very successful.

26920. *Dr. Hyder :* How many acres would be required in Gauhati for a middle-class man to settle on the land? He must work on the land himself with his own hands like an ordinary cultivator?—I have stated in my note that it will not pay.

26921. Then there is no chance for the middle-class people?—I maintain that by growing ordinary crops, a middle-class man cannot compete with a labourer who grows it himself. If the conditions are the same and if the mode of cultivation is the same, then he cannot compete with the local labourer.

26922. If he himself works with the assistance of hired labour?—He has better brains but as a labourer he will be inferior to an ordinary labourer.

26923. *Mr. Hezlett:* On page 180 of your note, you say that Government will not lease out land to men of the *bhadralog* class. I do not think that is a correct statement. If a middle-class man satisfies the Land Records Department that he is going to cultivate himself or by his servants, then Government policy, so far as I understand it, is to give that man the land he wants?—That may be the policy but it is very difficult to convince the Government officers that I am taking the land not for speculation but for cultivation.

26924. Do you not think Government must provide against men taking up land and leasing it off to tenants and so starting little estates of their own? Government does not want any middlemen between themselves and the actual cultivators of the soil, and that is the principle they work on. If a middle-class man wants to take up land and cultivate it himself, Government will give him the land he requires. I do not think your statement is quite correct there?—It represents my experience.

26925. You refer to the new condition in the leases of 1919. That refers not to the middle-class man, but to the man who lends money?—No, it is that the cultivator is not to sell land to any other man who is not a cultivator.

26926. He could sell the land to a middle-class man who was a cultivator. As regards the assessment of improvements made by the tenant himself, that has already been dealt with and Mr. Scott has explained the policy of Government?—I think what I say is correct.

26927. No. You should look at rule 106 on page 203 of the *Land Revenue Manual*, fourth edition. Such improvements are not assessed until the expiry of the subsequent period of settlement; i.e., thirty years at least?—But Government do not spend any money on irrigation here.

26928. We do not assess any improvements caused by irrigation for at least thirty years?—That is the present arrangement, but before that the period was twenty years and before that only ten years.

26929. Thirty years is now the standard, so that a man will not have to pay any extra assessment for thirty years?—That is so, but after thirty years he will have to pay more, and it is because of his labour the land is improved.

26930. But Government is entitled to a percentage of the improvement after thirty years?—Yes.

The Chairman: The minimum period will be thirty years and the maximum fifty-nine.

26931. *Sir Henry Lawrence:* Do you know of cases where zamindars have been deterred from making improvements because of the fear of increased assessment?—Before a settlement people do not take steps to bring the whole land under cultivation, but they do so after the settlement.

26932. *Mr. Hezlett:* On page 184, you mention the fact that the great increase in the price of milk is due to the grazing tax?—It has had something to do with it.

26933. It cannot have had very much. If we assume the price of milk is 4 annas a seer, on that the grazing tax will not amount to more than 2 pies?—But I find the Nepali graziers are not prospering.

26934. They are not prospering because they sell their milk at 1 anna a seer to a man who sells it in the market for 4 annas. It is not on account of the grazing tax, but through bad marketing?—These graziers were prospering when I first came to Gauhati, but they are not now. Those who live within a reasonable distance of Gauhati bring their milk in and sell it direct; they do not deal through middlemen.

26935. The increase in the price of milk is not due to the tax put on by the Government?—The price of other things has risen, but the price

of buffaloes has not risen, and I think that is due to depression in that trade. I find on inquiry these Nepali graziers are not prospering.

26936. That may be due to the fact they are in debt to the *mahajans* ?—They always were. The price of buffaloes ought to have increased considerably, but as a matter of fact it has not done so; it is the same now as it was thirty years ago.

26937. *Sir Henry Lawrence:* What is the grazing tax?—Rs. 3 per year.

26938. *Prof. Gangulee:* From the preamble to your note I find you have devoted a good deal of time and energy to agriculture and horticulture. Can you tell us if your example has inspired others in your district to interest themselves in these subjects?—I think it has done some good in encouraging gardening.

26939. You say you regret very much that on account of advancing age you cannot take an active interest in agriculture. Have you any sons?—Yes, grown-up sons.

26940. Are they interested in agriculture and horticulture? What is their profession?—One is in charge of my rice mill as engineer as well as manager.

26941. So your work will be continued by your sons?—It may be, but I find they do not take as much interest in it as I would like them to take.

26942. Did they have any education in agriculture?—No.

26943. Are you a member of any co-operative society?—No, but I am of the land mortgage bank.

26944. Do you come in contact with the cultivators of your district?—Yes.

26945. You know some of them intimately?—Yes.

26946. Can you tell us if their standard of living has risen during the last ten years?—That is a very difficult question to answer. They certainly smoke more cigarettes than they used to.

26947. Is litigation increasing?—To a certain extent it is, probably.

26948. *Mr. Calvert:* What kind of help do you want to receive from Government for this land mortgage bank?—We require a large amount of money, and, unless Government help us, people will probably be shy of depositing their money in our bank.

26949. You would like a loan to start with?—Yes.

26950. Speaking as a lawyer of eminence and experience, in your opinion are the courts making full use of the Usurious Loans Act?—Unless the amount involved is large, cases of moneylending do not often come into court. In cases where they do come up, the court gives relief.

26951. I thought 80 per cent of all civil cases in India were for amounts of less than Rs. 100?—That is so, but what I mean is that many cases of petty loans with exorbitant interest where relief is necessary do not come into court at all.

26952. Are the courts using this Act?—Yes; in all the courts the pleaders know that when they defend a poor ryot they can have recourse to this Act.

26953. *Sir Henry Lawrence:* What is the ordinary rate at which you hire unskilled labour to-day?—From 8 to 12 annas, I think.

26954. What was it when you began your farming operations?—Much less; not more than 5 annas or so.

26955. *Rai Bahadur R. M. Das:* From your experience as a farmer in this Province, would you say agriculture if followed as a pursuit by young men of the taluk class will pay?—I have gone into that matter very fully in my note. The growing of the staple crops such as the ryots grow will not pay him unless he changes the methods employed. With machinery and scientific agriculture it should be possible to make a decent living.

(The witness withdrew.)

The Commission then adjourned till 4 *p.m., on Saturday, the* 18*th December*, 1926, *at Jorhat.*

Mr. Mohendra Mohan Lahiri]

Saturday, December 18th, 1926.

JORHAT.

PRESENT:

The MARQUESS OF LINLITHGOW, D.L. (*Chairman*).

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S.
Sir THOMAS MIDDLETON, K.B.E., C.B.
Sir JAMES MACKENNA, KT., C.I.E., I.C.S.
Mr. H. CALVERT, C.I.E., I.C.S.
Professor N. GANGULEE.
Dr. L. K. HYDER.

Mr. J. HEZLETT, I.C.S.
Rai Bahadur RAMANI MOHAN DAS. } (*Co-opted Members*).

Mr. J. A. MADAN, I.C.S.
Mr. F. W. H. SMITH. } (*Joint Secretaries*).

Dr. HALFORD ROSS of the Assam Frontier Tea Company, Ltd., Talup, Assam.

Replies to the Questionnaire.

QUESTION 18.—AGRICULTURAL LABOUR.—(*a*) In tea-growing districts, by preventing malaria—(1) by drainage and oiling swamps, and (2) by reclaiming and preventing malaria.

(*b*) There is shortage of labour in tea-growing districts, Assam; the cause is malaria; coolies are frightened of fever.

(*c*) I suggest the prevention of malaria in the same way that the Suez and Panama Canal zones have been cleared of it; namely, by draining and oiling so that mosquitoes cannot breed. I am at present engaged in carrying out such measures in a group of tea gardens in Assam, and am willing to tell the Royal Commission how it is done, the cost and the results, which are very promising.

QUESTION 25.—WELFARE OF RURAL POPULATION.—(*a*) Yes. By preventing malaria in districts under the sway of agricultural industry. This can be done by the methods now being employed by the tea-growing industries of Assam, in Ceylon, in West Africa, in the rubber-growing industries of the Federated Malay States, in the sugar and rice-growing areas in the United States; and in many other parts of the world. The removal of malaria has been found to be a most important factor in "the promotion of the general well-being and prosperity of rural population." Its prevention increases output by more than a hundredfold.

(*b*) I suggest more than the conducting of economic surveys. I suggest the actual taking of steps to diminish malaria being undertaken by the Government in conjunction with those agricultural industries where the profits suffice for the collaboration. There is no need to delay in making surveys; the work should be begun.

(*c*) I was with my brother, Sir Ronald Ross, when he made the well-known discovery of the transmission of malaria by anopheline mosquitoes. Afterwards, I was Health Officer of the Suez Canal zone while that zone was being cleared of fever—there malaria has been entirely abolished. I was subsequently on the teaching staff of the Liverpool School of Tropical Medicine when expeditions for malaria prevention were being organised

in all parts of the world. And now I am conducting measures against malaria in the tea-growing districts of Assam, being on leave of absence from my post of Medical Officer to the Industries of the City of London, and Medical Member of Council to the Industrial Welfare Society.

Oral Evidence.

26956. *The Chairman:* Dr. Halford Ross, you are at present with the Assam Frontier Tea Company?—Yes, and with another company also; I am with two companies.

26957. I observe from the note you have been good enough to prepare for the Commission that you are willing to tell us what may be done to deal with the problem of malaria. Before doing so, perhaps you would like to touch on some points not mentioned in your note. Do you desire to make a statement of a general character?—The statement I have here refers entirely to the malaria problem, though not exclusively to that problem in its relation to the tea industry.

26958. I think we would like to hear what you have to tell us on that matter?—There are no special difficulties in preventing malaria and other mosquito-borne fevers in the Upper Assam tea plantations. It is, indeed, easier to accomplish here than in Ceylon or in the Federated Malay States, because of the regular cold weather which occurs in Upper Assam, when the mosquitoes hibernate; this gives us more time to deal with the insect pest, which is the only satisfactory way of getting rid of the disease. Malaria is conveyed from one human being to another only by the anopheline mosquito; it is not carried in any other way. Dengue fever, on the other hand, and some other shorter-term varieties of fever which do a great deal of damage amongst the human population of India and other parts of the tropics are carried by what are known as *kurasin* or domestic mosquitoes, which are very prevalent in Upper Assam as well as in other parts of India. Only the female mosquito sucks human blood; the male is a vegetarian. It is a very remarkable thing, but it is only the fertilised female mosquito which sucks blood. The reason seems to be that the extra nutrition obtained by sucking the blood of human beings, monkeys, bats and birds gives the female more strength to generate her young. "The female of the species is more deadly than the male." After the discovery in Calcutta and Secunderabad in 1897 and 1898 of the anopheline mosquito, an attempt was made in the Suez Canal to get rid of malaria by dealing with the breeding-places of the mosquito, and by oiling the surface water, which prevents the mosquito larvæ coming to maturity. I was Health Officer there., Malaria was abolished in six weeks, and in one town—Port Said—mosquitoes have not reappeared in the last fifteen years and mosquito nets are no longer required; indeed, they have not been needed at all during that time. All the world knows of the work done by the late General Gorgas in the Panama Canal area, and by others in West Africa, Alabama, Louisiana, Florida, Brazil, the Federated Malay States (by Sir Malcolm Watson) and in various other parts of the world, where malaria has been abolished. In India alone, these measures against malaria have not been taken very seriously; I do not know why, in view of the fact they have been applied so successfully in other countries. Sir Malcolm Watson began measures for two tea companies in Upper Assam three years ago, and I have now come here for two other adjoining companies, so that we are at last making a beginning, although a belated one, in India, to prevent this disease. In upper Assam, the chief breeding-places of the mosquitoes are the swamps which surround and intersect the various tea estates; in bamboo stumps which form cups in the palisades, which cups get filled with water and are a fruitful cause of mosquito-one, in India to prevent this disease. In Upper Assam, the chief breeding-barrels and jugs lying neglected in compounds, in lines, and in *busti* houses occupied by coolies. The methods of dealing with the breeding places are as follows. In the first place, it is necessary to drain the swamps near tea garden bungalows, coolie lines and (where possible) *busti* communities. These last, being in outlying parts, are sometimes rather difficult to reach, especially in the rains. Each swamp should have a central drain, or, if there is already an existing central stream, this should be straightened, deepened and widened. It is very important to remember that in most of these swamps in Upper Assam, and in most of those I have seen in other parts of India, the central stream ambles along

in S-shaped curves. The important thing is to canalise it. It can be done very cheaply, because up here the earth in the swamp is very soft and there is no rock or stone. In addition to the central drain, we build contour drains round each side of the swamp, following the edge on both sides. These are shallow drains 5 feet wide at the top and 2 feet 6 inches deep. It is important that they should not be more than a foot wide at the base or bottom of the drain. These contour drains are connected with the central stream at intervals, and in this way the swamp becomes slowly quite dry in the centre, and the water is drained into the central stream instead of lying in the marshland, so that we can oil the water and keep it under control, the whole object of the process being to have what we call "water-tidiness" instead of swamps. By means of these drains, moreover, the flood water is got away from the neighbourhood much more rapidly, and the contour drains intercept any seepage there may be from the higher banks which are under cultivation. The cost of this drainage varies, but it has not yet exceeded Rs. 12 per acre of the area of cultivation. Usually it is very much less than that. The cost of it should be met from capital account, for it is a permanent and final cost.

Secondly, there is maintenance. This consists of two gangs of coolies in each division of the estates to be dealt with, such divisions not exceeding 1,000 acres. These two gangs are under the control of foremen and each consists of three men. One gang of three men, with the foreman, keeps the drains in good order and repair, grades them regularly and sees that the water does not stagnate in them. This gang is occupied during the rains (when it cannot work in the marshes) in cutting bamboo stumps off through the top notch, in order to prevent them retaining water in which the mosquitoes can breed. The other gang, under another foreman, is given a 40-gallon cask containing mixed equal parts of crude petroleum and the cheapest obtainable kerosene. This 40-gallon cask is on wheels (I generally use old buggy wheels) and it visits every part of the area; it visits each swamp, all the coolie lines, and the compounds of every house and bungalow at the same hour of the same day every week in the year, oiling all collections of stagnant water, and upsetting all tubs, barrels, jugs, etc., which could harbour mosquitoes or enable them to breed. It is most important that the work of this gang should be done regularly once a week. Those swamps which for any reason cannot be drained should be treated with Paris green once a week. This is a compound of arsenic which should be mixed with dry road dust in the proportion of one part of Paris green to fifty of dust (by weight) and it is wafted over the swamp; it is thrown up into the air by the handful over the swamp from the edge, so that the wind shall take it and allow it to settle on the swamp. It is quite harmless to all life except the anopheline mosquitoes which feed on the surface of the water, or just below the surface. Unfortunately its action is uncertain, because it depends on the vagaries of the wind, and therefore it cannot be relied on and must only be used as an adjunct; it cannot replace draining and oiling. We have found the maintenance costs come to Rs. 1-8-0 per acre of cultivation per year, which is not a very large sum. You have therefore two expenses; the initial, permanent, final cost of the drainage and the small charge for annual maintenance. There is one thing which is essential for the success of this work: it requires the keenest enthusiasm of all concerned. If managers and assistants and others *connected with the industry become* apathetic, all the good work that has *been done in the past will be undone, and the work will fail* according to *the degree of the apathy displayed. If, on the other hand,* the work is *ways conducted with keenness, it will result in immensely improved* health *the industry concerned (whatever it may be) and will lead to* a great rease of efficiency and to greater production and greater happiness on part of the workpeople employed.

26959. Have you long experience of India?—I have been here three times. s time I arrived only last April.

26960. How far do you think a scheme of the type you have outlined uld be applicable to a typical rural area?—Success would vary according the amount done. Mosquitoes do not fly far; the average flight of a squito is rarely more than half a mile, and she will not fly even that tance if she can find plenty of food and water without going so far. therefore, anyone living in a rural area chose to undertake the ring of his own and his friends' houses within half a mile, it would of great benefit to them.

. Halford Ross]

26961. *Mr. Calvert:* How far can they be blown?—We found by experiment and observation in the Suez Canal area that the utmost limit was less than a mile. Some people have said that with a gentle following wind a mosquito may go a mile and a half, but a mosquito is a very delicate creature and a strong puff of wind may kill it. A mosquito always prefers a still night.

26962. *The Chairman:* Under the conditions in which you are now carrying on your campaign, you have, of course, the organisation of the tea planters behind you?—Yes.

26963. How would you go about it if you were asked to apply these more or less complicated and not inexpensive expedients to an ordinary rural area?—It can only be done by getting people to combine, each subscribing a little. It has been done over and over again.

26964. Where?—In Egypt, for example; in Cairo. The inhabitants of Kasrul-Dabara, which is the official district of Cairo, all subscribed and put the work in the hands of one man who was rather keen. It only cost them a few shillings per head, and this individual got his gangs together and his oil barrels and has been quite successful.

26965. *Prof. Gangulee:* It was a purely non-official body?—Yes.

26966. *The Chairman:* Those were urban people of the well-to-do class, were not they?—Yes. But there have been a good many crusades carried out in South America by people who are not at all well-to-do, but who have been under the necessity of doing something, because there they have the mosquitoes which carry yellow fever.

26967. The main object of the Panama Canal campaign was to stamp out yellow fever, I believe?—No, I think malaria was the chief cause of the trouble there.

26968. How wide is the belt that has been cleared?—The canal is fifty miles long, and I think the belt is five miles broad.

26969. Beyond that belt, are the diseases as bad as ever?—Yes.

26970. So it is the economic opportunity afforded by the canal which has enabled this important work to be carried out?—Yes. De Lesseps failed on account of malaria, you will remember, and the canal could not be carried through until it was stamped out.

26971. *Prof. Gangulee:* Who financed the anti-malaria work in the Panama Canal zone?—The American Government.

26972. *Dr. Hyder:* How many years did they give to the campaign in Panama?—General Gorgas did the whole thing in two years, I think; but of course they still have to do the maintenance work, just as I have described it here. That must go on for ever. If the maintenance gangs cease work the mosquitoes will soon come back.

26973. *The Chairman:* And will malaria return?—Yes.

26974. Where from?—The infection comes in through immigration.

26975. You have always got the carrier ready to infect the mosquito?—Yes. You cannot exterminate an insect completely; you can only reduce it to a negligible quantity.

26976. But I can conceive a situation arising after a certain number of years when no malaria would be present in any human being, as in England?—Yes, but as world communications improve, there will always be a liability for it to be introduced.

26977. On page 189 of your note, you refer to economic surveys in connection with anti-malaria work. Do you think these economic surveys might be a sound foundation on which to proceed?—No. I, and many others, have been asked over and over again to make a survey for this work, and we go and make a survey, and there the matter ends. We are always making surveys. The other day I went to a large tea estate, where I found pigeon-holed no less than five surveys.

26978. And not a single one had ever killed a mosquito?—No; no attempt had been made to carry them out. The matter got as far as the survey, and that was the end of it.

26979. *Prof. Gangulee:* Did you derive any useful information from those surveys?—It was interesting to examine them, because there were slight differences of opinion between the five gentlemen who made the

surveys, but it was rather heart-breaking. The estate had spent a good deal of money on having these surveys made, and there the matter had ended.

26980. *The Chairman:* Are you familiar with the health organisation of the Central and Provincial Governments in India?—I have not gone into it very carefully, because I do not have much to do with Government here.

26981. You would not wish to say anything about the presence or absence of sufficient organisation to deal with this problem?—From what I have seen in Assam, the organisation is sufficient to deal with it in certain industrial districts, but I doubt if the Government organisation would be big enough at present to deal with it over the country as a whole. I certainly think, however, a great deal could be done in industrial districts.

26982. Would you associate wet paddy land with the growth of the anopheline mosquito?—Hardly at all. If you remove the swamps, I do not think paddy land will account for much malaria.

26983. *Mr. Calvert:* Why not?—Before the rice is sown, in most of these paddy fields there is a water bug which eats the mosquito larvæ. This bug cannot operate after the rice is sown, because the stalks grow up quickly and interfere with it. I find, however, that in the majority of paddy fields there is no necessity to keep the land everlastingly sodden. The rice has to be planted in water, but the natural rainfall is usually enough, and if there is any chance of getting the extra water off the rice land, the rice will be all the better for it and the mosquitoes all the worse. I do not associate paddy land, by itself, with the causation of much malaria; it is the swamps and marshes that cause the trouble.

26984. *The Chairman:* Speaking of the conditions under which you are working at this moment (those of the average tea plantation in this Province), do you think it would be possible to control malaria in the tea plantations as it has been controlled, say, in the Panama belt?—Yes, I am convinced of it. I am convinced that if an organisation like the Indian Tea Association were to undertake the malaria problem thoroughly, the disease could be almost abolished in the tea industry, so far as Assam is concerned. I have not vast experience of the parts round Sylhet; I saw them in the rains, and that is all. So far as this district is concerned, however, I am convinced we could limit malaria to a negligible amount; we could practically eliminate it. If people will only get together, it can be done.

26985. *Dr. Hyder:* What measures would you recommend for Bengal? Bengal is one big swamp?—I do not know Bengal very well. I know Calcutta, and I have passed through Bengal in a train in the rains. I am convinced a great deal could be done there. Remember, no matter how little you do, every little counts. If you reduce your mosquitoes by 25 per cent, you reduce your malaria by 75 per cent because the malaria-mosquito ratio is geometrical and not arithmetical progression. Every little that is done helps, and will produce beneficial results so long as it is persevered in. A great deal could be done, I am convinced, in the iron ore obtaining districts in Bengal.

26986. *The Chairman:* Do you know what is being done in the coal-mining districts?—They have sometimes asked me to advise them, but I have not heard definitely. At Asansol, there is a Health Board which is very keen on the work, but what has actually been done in the way of the prevention of malaria by these methods I do not know.

26987. *Mr. Hezlett:* With regard to cost, do you mean the first cost is Rs. 12 per acre of tea or per acre of swamp?—Per acre of tea.

26988. The maintenance costs also are per acre of tea?—Yes.

26989. Per acre of tea under cultivation?—Yes.

26990. *Prof. Gangulee:* Is the scheme you have outlined already working in Assam?—Yes, on six estates.

26991. Six different centres?—Yes.

26992. For how long has it been working?—Sir Malcolm Watson began it three years ago in one district; Dr. Bennett began it eighteen months ago in another, and I started here last April.

26993. Have you anything to say with regard to the result of these experiments?—Yes. There is a very considerable reduction of malaria in one of the companies; the other companies have not been going long enough to get figures. Malaria is a very slow-going disease.

26994. What is the method of applying kerosene oil?—The female mosquito lays her eggs on the surface of stagnant water, also of running water but not very fast running water. It lays 150 eggs and out of each egg comes a little larva which lives for 12 days in the water; the larva breathes either through its back or through its tail; it puts the tail up through the water and breathes from the surface and if you cover the surface with oil, it dies. The oil should be on the water for half an hour at least and it should be applied once a week to be within the safety limit.

26995. You made a reference to the work done by the rubber-growing areas in the Federated Malay States; was it Dr. Watson's work?—Yes, Sir Malcolm Watson.

26996. Are the conditions prevailing in Assam the same?—No; the conditions prevailing in Assam are very much better because we have a cold weather here and they have not.

26997. Do you consider irrigation responsible for the prevalence of malaria?—Irrigation, if badly controlled, would give rise to malaria; but irrigation if properly controlled would prevent malaria.

26998. What do you actually mean by saying 'badly controlled'?—The ancient Egyptians used irrigation that was the cause of malaria and it is believed that malaria wiped out the whole race; that was when water was allowed to overflow and form swamps. But in Modern Egypt with no Nile water running into the sea and all being used for irrigation, there is no malaria because the water is kept in proper bounds and does not form swamps at all.

26999. Would you say that the embankments as they exist in the deltaic tracts of Bengal and in some other parts of India, for instance in the Godavari delta, are badly controlled?—I am afraid I have not seen them.

27000. Or as they exist near Burdwan?—No; I have not seen them. But does the water flow over the embankments?

27001. No, not always?—Then it ought not to be malarious.

27002. Sometimes it over-flows the embankments and sometimes it does not. Do you associate embankments with malaria?—Not embankments by themselves; if the embankment is bad and it allows the water to flow loosely all over the place, then you are bound to get malaria.

27003. *Mr. Calvert:* Were you quite fair to the authorities in India when you said that measures had not been taken seriously here? Was not there a Malaria Commission?—But so far as I know, nothing serious has been done.

27004. Was not a serious attempt made in this direction and an experiment also tried in Lahore Cantonment?—Yes, and it failed; and we always believed that that experiment was never done properly and that it was a failure because there was a great amount of lethargy shown.

27005. Sir Walter Kitchener was in charge?—I do not remember; but India was always lagging behind in these matters when compared to other countries throughout the world.

27006. They are all practically small areas?—There are big areas too. What about Brazil? They have been working there for ten years and they have got rid of much malaria. All the malarious areas in the whole of the United States have all been dealt with. I think I was perfectly justified in that remark. India has been very much behindhand in these matters considering the amount of malaria it has.

27007. You say the cost amounts to Rs. 1-8-0 per acre cultivated. That is about the equivalent of land revenue. You propose an experiment which involves an expenditure equal to the land revenue?—In an industry like tea; that is what it has cost us on a tea estate.

27008. That is only in Assam. Do you think it would be less under average conditions?—Yes; but in any case whatever the cost it would be worth while incurring it, if we are going to improve the health of the population.

27009. But it is a recurring charge?—Even so you have to pay. England is the healthiest country in the world, but look at the taxation it has.

27010. You double the burden on the land?—That may be, but it is worth if you are going to get a healthy population instead of a diseased one.

27011. Even at a financial sacrifice?—Yes.

27012. I gather that you get better results in the case of an island?—It depends how big the island is; a very small island, as big as this compound will not do. But remember this, that if you had it on a very small area you would find it very difficult to get results in figures; it is much better to take bigger areas and get people to combine and undertake it on a large scale rather than a small one, and it is much cheaper too.

27013. You mention that a decrease in the number of mosquitoes led to a still greater decrease in malaria; but the converse does not hold good, that an increase in the number of mosquitoes will lead to increase of malaria?—Yes; it does, if proper safeguards are not taken.

27014. There was an enquiry in the Punjab which showed that mortality from fevers bears no relation to the number of mosquitoes?—Yes; I said the amount of fever would increase; I was not referring to the death rate. The more mosquitoes there are, the more fever you get; but the death rate depends on a good many factors. You have got a certain amount of immunity, especially in grown-up people, which varies in different districts and in different individuals. Immunity is a very big question and the death rate does not depend entirely on the fevers. And, as I said just now, the incidence of malaria must vary directly with the numbers of the infected insects.

27015. You talked about the officials not taking things seriously; but, taking a Province with 29 million acres, it is the amount of money, the cost required, that has to be taken into consideration; it is not lethargy but a question of practical difficulties?—Yes; but you have to attempt it and you will succeed.

27016. It failed in the particular case?—That is the only one case which really occurred in the whole world. We think that is all out of date. We know it has been successful in other parts of the world and it is high time to do it in India. Remember you are losing in India more than a million people every year from malaria.

27017. If you are so certain that this could be carried out successfully, to what do you ascribe what you call the lethargy of the military medical officers?—I really do not know. That discovery was made quarter of a century ago.

27018. *Prof. Gangulee:* How do you explain the apathy of the people who suffer?—That is due to ignorance. So far as India is concerned, a lot of it is due to ignorance on the part of the people. It is a country with very little primary education, and if there is primary education I do not think they are taught much about cleanliness and sanitation; it is a most insanitary country.

27019. *Rai Bahadur R. M. Das:* Is it a fact that the mosquito breeds in small holes, ditches and ponds in private compounds?—Yes.

27020. Is it not, therefore, necessary that the compound of every householder should be attended to and treated before the big projects you speak of, involving heavy outlay, are undertaken?—I think it is very sound; but the problem is not entirely in the compounds of private houses.

27021. Then how do you propose to have this done?—In the way I have described gangs of men going round and draining away all the stagnant water, or oiling, as the case may be.

27022. In private compounds?—Yes; not inside the houses. There is nothing inside the houses.

27023. I am speaking of the compound. Within the compound there are holes, ditches and other places where, as you say, the mosquito breeds. How are you going to deal with these breeding places?—They should either be filled up or oil should be applied once a week.

27024. Who is going to put the oil in?—I have already said we must get the people to combine; it requires organisation, but I am sure it is most valuable.

27025. Unless people realise the importance of it, do you think it is possible?—But surely the people must realise the importance of it now after quarter of a century; it is a long time.

27026. And who is going to pay for this expenditure?—You mean in general agriculture?

27027. There are people in various occupations?—That ultimately must come round to the Government, until the people are educated. To-day I think Government could do a great deal.

27028. So it should be done by the Government?—Not all; Government cannot do it all alone. As I said in the penultimate paragraph of my remarks, you must have keenness on the part of all concerned; and, what I do consider as most important so far as health is concerned, there ought to be a great deal of health education and propaganda going on in this country.

27029. Propaganda work is necessary?—Yes, absolutely necessary.

27030. *Sir Henry Lawrence:* What powers did the Sanitary Officers have in Port Said to enforce sanitation on the people?—I was the Sanitary Officer and I had no powers at all. So far as Egyptians were concerned, they were under the Egyptian Government and Government could not enforce a good deal of its own laws. But Port Said was a town of 50,000 people, where there were more than 15,000 Europeans belonging to most of the large nations of Europe; each of those nations was represented by a Consul and the Europeans were under those Consuls. I had the greatest difficulty with some of these Europeans firstly, in getting them to allow our mosquito gangs into their houses. They thought that I was trying to abrogate their privileges till I explained things to them; I talked to them; I implored them and eventually they gave way and we were successful. I was careful in choosing my men, made sure of not having thieves among them; and ultimately the whole thing went through; there has not been a mosquito-net now in the town for the last fifteen years.

27031. And no regulations were imposed on the people?—No; all was done by persuasion.

27032. You spoke of some powers of the Egyptian Government?—The Egyptian Government had legal powers to allow the officer, that is, myself, to enter the houses; but I had no powers to go inside the houses or the compounds of the Europeans.

27033. That is as regards the Egyptian population?—The Egyptian population was comparatively easy. I had the power behind me, but they never raised the slightest objection. The objections wherever they were raised were from the European Consuls.

27034. *Sir Thomas Middleton:* How would you deal with such large sheets of water as village tanks?—By clearing the sides of vegetation. Mosquitoes will not breed in the middle of the tanks, but they will breed in the vegetation round the edge if you allow the vegetation to grow.

27035. So that it will not be necessary to oil a tank?—No; but you must oil round the edge; just a spray of oil round the edge would be sufficient.

27036. *The Chairman:* It is important to allow the sun to reach the surface of the water?—Yes; sunlight on the surface of the water will keep mosquitoes from breeding.

27037. So that overhanging trees ought to be removed?—Yes; that is most important. Still more important is the removing of vegetation growing round the waters' edge.

(The witness withdrew.)

Rai Sahib NARAYAN BARUA, Honorary Correspondent, Agricultural Department, Assam.

Replies to the Questionnaire.

QUESTION 1.—RESEARCH.—Research work in Assam is practically poor, there are no officers nor proper facilities. Up to this time except a little work in paddy and sugarcane, no other important crops such as mustard, cotton, etc., are yet taken up. No attempts practically have been made in ascertaining the usefulness or necessity of superior types of plough, etc.

Similarly no research work has been taken up on the usefulness of indigenous drugs and methods of treatment of cattle nor on the improvement of cattle.

QUESTION 2.—AGRICULTURAL EDUCATION.—(*ii*) Certainly there is. Village schoolmasters who are trained in the art of teaching in the normal schools at Jorhat and Silchar should have a sort of both theoretical and practical agricultural training along with their course so that when they come to village schools, they may make use of their agricultural knowledge in training little boys in the simple methods in order to give them a love of agriculture from their tender age.

In the secondary schools, an additional class for agriculture should be opened in charge of a teacher who is properly qualified in agriculture.

Similarly in the arts college there should be a higher class for agriculture in charge of qualified teachers.

(*iii*) Naturally it should be desirable to draw teachers from agricultural classes in rural schools in rural areas.

(*iv*) At present, there are no agricultural institutions in the Province where students may be trained in agriculture except in some Government farms where demonstrators are trained for only public service. There has been no demand so far for agricultural training by youths.

(*v*) If it could be practically demonstrated that agricultural farming pays as much as that it fetches a net income of Rs. 1,000 a year and if proper facilities for training, acquiring land and capital expenses and all other necessary help from the proper direction be given, there is no reason why there should be no youths forthcoming for taking up agriculture as their profession.

(*vi*) Not generally.

(*vii*) Does not arise.

(*viii*) These should be maintained but, unless the teachers are well trained, it is all the same whether these exist or not.

(*ix*) Public service in the Agricultural Department.

(*x*) As shown in (*v*) above.

(*xi*) Not at all but it is extremely necessary to improve and refresh their knowledge.

(*xii*) By practical demonstration, evening classes and lantern lectures by itinerating parties.

(*xiii*) (*a*) Village authorities in co-operation with the Agricultural, Veterinary and Co-operative Departments.

(*b*) Local Boards, local funds and contributions from Government departments.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(*a*) By practical demonstrations, agricutural shows, lantern lectures and by publication of periodicals, leaflets, etc.

More honorary correspondents should be appointed in suitable centres and full facilities should be given them for carrying out demonstrations and propaganda work.

(*b*) Demonstrations should be held actually on the ryots' holdings. As soon as the result of demonstration is noticeable, neighbours should be collected together and the effects explained to them. Photographs of

such demonstrations and of harvests should be taken and lantern slides should be made of them. Then a public meeting should be organised where lantern lectures explaining the nature and result of demonstrations should be given, and also handbills describing the above facts should be distributed.

As far as possible, local small agricultural shows should be organised in the two seasons of the year.

The above steps are bound to attract attention of some cultivators. When this is so, seed, manures, implements, etc., as the case may be, should be supplied free or at concession rates. Then the demand for undertaking demonstrations may increase and effectiveness of demonstrations may go ahead. Money should not be grudged at this stage.

(*c*) Success of demonstrations and sympathy and good nature of the demonstrators and the superior officers who should be sons of the soil as far as practicable and who are in touch with the ryots go a great way to induce cultivators to adopt expert advice.

(*d*) So far as I know, much success has been achieved in the popularisation of superior varieties of sugarcanes and potatoes and of three-roller iron mills and *gur* boiling iron pans.

Success to a degree has also been obtained from *Indrasail, Georgesail* and *latisail* and *kataktara aus.*

Manure demonstrations such as bonemeal, oil-cake, etc., in paddy and sugarcane, although proved successful, have so far failed to induce cultivators to adopt them on account of high prices of bonemeal and oil-cake.

For want of reliable seed, sometimes the demonstrations fail.

QUESTION 4.—ADMINISTRATION.—(*b*) The Head of the department should be an expert. He should have a general broad outlook and be a man of varied experience. Heads should not be selected from any specialised branch of agriculture.

(*c*) (*i*) Not fully. The services are handicapped for want of men. The Provincial Agricultural Service may be extended and a Provincial Veterinary Service may be organised. The number of Agricultural Demonstrators should be increased and an intermediate service between the Agricultural Inspectors and Agricultural Demonstrators should be organised. In the Veterinary, an intermediate service between the Superintendent and Inspector which may be styled as Provincial Veterinary Service may be organised.

The pay and prospects of Agricultural Inspectors and Veterinary Assistants should be improved.

The members of the Imperial Agricultural Service may be appointed for research work in the different branches of agriculture.

(*ii*) Yes, generally with the system. But rates of freight should be more uniform and agricultural produce, seeds, manures and implements, etc., should be given concession freights and borne with more care and in special vans whenever necessary.

(*iii*) Yes, more or less but more cartable feeder roads with permanent bridges and culverts are necessary.

(*iv*) A branch of the Meteorological Department may be established with advantage and research work should be undertaken with the old system of forecasting.

(*v*) Post and telegraph offices may be increased. Some concession in fees may be given for parcels of agricultural seeds, etc.

QUESTION 5.—FINANCE.—(*a*) The present system of granting loans to cultivators is not very encouraging. The fund that is now at the District Officers' disposal is too small and not far-reaching. The fund may be divided between the District Officers and the Director of the Department. Small short-term loans such as for purchase of seeds, cattle, etc., may be disposed of by the District Officers and bigger long-term loans required for special purposes and agricultural improvements may rest with the Director of the Agricultural Department.

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(*b*) The amount of the agricultural loan as is the custom at present is not sufficient and at the same time is not easily available. The present process of supplying and securing a loan is rather tedious and sometimes vexatious. If improvement could be effected in the system, probably the cultivators will be more induced to take advantage of more loans.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(*a*) (*i*) Failure of crops due to season, flood, insect pests, etc., wild animals, failure of health, cattle mortality, want of good seeds, joint family system and generally want of education.

(*ii*) Village moneylenders, Marwaris and co-operative credit societies to some extent.

(*iii*) Heavy interest, and also for causes as given in (*i*) above.

(*b*) There should be a net-work of co-operative credit and agricultural purchase and sale societies all over the Province and the Town Banks and Central Banks should be better financed.

(*c*) Yes, such measures are necessary.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—(*a*) Consolidation of holdings as introduced in the Punjab may be tried. Village authorities may also take some lead in the matter.

(*b*) Personal jealousy, animosity, and self-interestedness. This may be overcome by persuasion and better education.

(*c*) Yes.

QUESTION 8.—IRRIGATION.—No systematic measures for irrigation have ever been taken in the Province although there are necessities in every district. There are innumerable sources of water-supply such as rivers, streams, tanks, but no advantage has ever been properly taken. Force pumps, chain pumps, bucket pumps, etc., may be tried and introduced whenever possible. A system of irrigation by bunding may be tried where possible.

Want of proper initiative.

QUESTION 9.—SOILS.—(*a*) These are more or less local matters to be dealt with under local conditions.

(*b*) (*i*) Such improvements may be found generally in tea gardens, and partially round about village-sites.

(*ii*) Most of the *rupit* lands have undergone deterioration.

(*c*) Government should arrange a survey of such areas of cultivable land which have gone out of cultivation and take every possible measure to investigate and find out ways, on scientific and practical lines, for improving such lands and then by demonstration of such methods the areas may be improved. The methods should be inexpensive at the same time.

QUESTION 10.—FERTILISERS.—(*a*) Both. Proper measures have not yet been taken.

(*c*) First experiment and then demonstration, then propaganda.

(*d*) Except in tea-gardens not known in cultivators' land.

(*e*) Not yet.

(*f*) Use very rare in this Province.

QUESTION 11.—CROPS.—(*a*) (*i*) Some improvement has been made in sugarcane but not so much in potatoes, paddy and jute.

(*ii*) Many useful crops, such as pulses, *khesari*, *masuri*, peas, gram, etc., oil-seeds such as linseed, ground-nut; wheat, barley, coffee, arrowroot, *sati*, cassava and some medicinal and perfumery plants and fodder grasses such as Guinea grass, Job's tears, etc., are to be introduced.

(*iii*) Better seeds should be produced and better system of distribution also should be introduced.

(*iv*) By granting more licences for guns, and introduction of effective traps.

(*b*) No.

(*c*) Sugarcane, paddy, jute, potatoes, etc.

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QUESTION 12.—CULTIVATION.—(*i*) First improve the cattle of the cultivator then try to introduce better ploughs and other implements.

(*ii*) The present system of rotation of crops is quite all right but mixtures of crops such as *masuri* in mustard, *khesari* in paddy, etc., is recommended.

QUESTION 13.—CROP PROTECTION, INTERNAL AND EXTERNAL.—(*i*) The present measures, I think, are sufficient.

QUESTION 14.—IMPLEMENTS.—(*a*) Some improvement in the existing implements and introduction of time and labour-saving implements such as seed-drills, hand hoes, hand-ploughs, weeders and gardening tools, and water-lifts, etc., is necessary.

(*b*) They should be cheap and easily available and easily repairable.

(*c*) Manufacturers should arrange to establish sale depôts in suitable centres and also keep trained mechanics for quick repairing and also arrange to distribute such implements on easy-term instalment system in co-operation with the Agricultural and Co-operative Departments.

QUESTION 15.—VETERINARY.—(*a*) Preferably under the Director of Agriculture, so far as present circumstances are concerned.

(*b*) (*i*) Yes; not satisfactorily as Boards do not keep sufficient number of them and do not provide with sufficient medicine.

(*ii*) Not satisfactorily.

(*iii*) Yes.

(*c*) (*i*) Yes, but these are very few and sufficient help is not found.

(*ii*) Yes, practically there are no touring dispensaries and if there be one or two here and there these are not well organised and not sufficiently stocked with medicines.

Touring dispensaries should be distinct from stationary dispensaries—one Veterinary Assistant in charge of a dispensary should be always on the move and he must have plenty of medicine in stock and must be able to halt at suitable centres for longer periods and he should also take notes of special cases of ailments to report to his superior authorities.

(*d*) Conservatism, prejudice and superstition generally stand in the way.

Not in the literal sense but certain instruments for giving occasional frightenings to the cultivators of uncompromising attitude may be found useful.

(*e*) Yes, there is some difficulty in getting timely and sufficient supply of serum in times of epidemics as in the present year.

(*f*) As stated in (*d*) above. No fee is charged.

(*g*) Yes.

(*i*) & (*ii*) Whether the Research Institute be extended at Muktesar or there be one in the Province, I think, does not matter; the only thing wanted is more and timely supply of serum.

QUESTION 16.—ANIMAL HUSBANDRY.—(*a*) (*i*) By providing a good number of breeding bulls and sufficient grazing grounds throughout the Province.

(*ii*) Practically there is nothing of that sort. Whatever there is it is in the hands of the illiterate Nepali and Deshwali Khutiwallas in the crude state. There is ample field for improvement by education.

(*iii*) Practical methods of better handling of livestock, housing, feeding, milking, etc., should be introduced by demonstration.

(*b*) (*i*) The common pastures are few and far between and greater parts of them are practically of no use as some of them lie in the out-of-the-way places; some of them are deep jungles and some of them are low lands with *kurkanis*. Besides, there is no facility for drinking water in such grazing grounds.

(*ii*) Enclosed pastures are generally absent.

(*iii*) Generally not insufficient in respect of straw.

(*iv*) Generally insufficient in the dry season.

(*v*) Not investigated.

(*c*) From 1st October to middle of November. Last three weeks of November. About six weeks.

(*d*) By the introduction of the cultivation of fodder grasses such as Guinea grass, Elephant grass and Job's tears and any other suitable grass.

(*e*) By persuasion and education and by practical demonstration.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(*a*) An average cultivator spends about 150 to 200 days in his agricultural operations; about fifty days are occupied in sickness; observing social and religious ceremonies, occupies fifty to sixty days in either holiday-making and idling and the rest he spends in collecting fuels, materials for house-building and repairing, etc.

(*b*) (1) Assam is rich in raw materials; if Government established any match factory or paper mills or if such industries be established by private agencies, then cultivators may supply sticks or pulps as may be required by the factory.

(2) Spinning and weaving of cottón and silk should be more widely encouraged. Weaving of jute for gunnies and hessians may be introduced.

(3) Cane and bamboo work and *sital pati*, grass mats, etc.; pottery and tile-manufacturing should be more encouraged and more facilities for collection and disposal may be found by the State.

(4) There is ample scope for establishing workshops, for manufacturing useful agricultural implements such as ploughs, *bidhas*, scythes, etc

(5) There seem to be chances for canning industry, soap manufacture, cigar and cigarette manufacturing, etc.

(*c*) Caste system, ignorance and want of proper facilities and technical knowledge. At any rate, regular steps may be taken for popularising these important industries.

(*d*) Most certainly.

(*e*) Not necessarily but on the other hand this should not be encouraged.

(*f*) Most certainly.

(*g*) Let there be more organised village organisations and authorities to learn more self-help and mutual helpfulness.

(*h*) The above agency will go a great way to help the people in looking after their sanitation. Education and practical demonstrations on the various aspects of sanitation, etc., may be given more widely.

QUESTION 18.—AGRICULTURAL LABOUR.—(*a*) Practically there is no surplus of agricultural labour; if there be any anywhere this may be drawn to—

(*i*) by offering higher wages, more comforts and more brotherly treatment and by giving allowance for caste prejudices and allowing share-system of cultivation, commission system of remuneration, if necessary;

(*ii*) by encouraging "*Pam*" system by giving all necessary Government help for the protection of their own lives and crops and cattle.

(*b*) Contentment due to low-standard of living and comforts, sense of self-respect, low birth-rate, excessive drug habits, are some of the main causes of shortage of labour. Time and education are its healers.

(*c*) Migration may be considered.

QUESTION 19.—FORESTS.—(*a*) I suppose to some extent grazing facilities are limited and also so far as I know availability of suitable wood from forests for purposes of ploughs, etc., is becoming more and more restricted. More facilities under proper regulation may be given.

(*b*) There are grazing grounds in some rural areas but these are devoid of any trees and there are some which are under shrub jungles. Attempts may be made through forest regulation for afforestation. There are also uncultivated shrub jungles under pattas. Encouragement may be

given to the patta holders for afforestation, if proper concessions be given in land revenue. This procedure will help matters in the supply of ploughs, etc., as stated above in (*a*).

(*c*) Yes, to some extent. As deterioration goes on in the forests, improvement in the leading *khals* and channels should go on simultaneously.

(*d*) By the planting of shade trees such as *Siris and Medeloa*, etc., in vacant lands.

(*e*) Yes, to some extent.

QUESTION 20.—MARKETING.—The existing market facilities are more or less satisfactory; matters may improve gradually with the opening of more feeder roads and railways.

The Province goes probably without a Chamber of Commerce and Agriculture; if there be any it is hardly known to the people.

There is a lack of *aratdari* system of disposing of surplus produce amongst the Assamese; with commercial education this may take a turn.

There are no purchase and sale societies governed by the co-operative principle. This may be encouraged.

Most of the valuable produces such as paddy, mustard, gum, lac, are disposed of through middlemen who for the greater part are foreigners.

Village moneylenders and *mahajans* feed upon the fat of the producer whereas the producer himself gets only a fraction of the actual profit.

Consumers often have to pay three to four times the actual value of the produce that the producer gets.

Barter system is greatly in vogue in the Province and this system has its own baneful effects as well as its benefits. Generally the producers are illiterate and they are deceived in weight or prices or exchange.

Such are the drawbacks in the disposal of agricultural produce. Irreligion and want of education are at the root of all evils. Education, co-operation, village organisations and agricultural associations may be of immense benefit to the cultivator.

QUESTION 21.—TARIFFS AND SEA FREIGHTS.—Small custom duties on imports of food and clothing materials and high duties on such exports do adversely affect the prosperity of the Indian cultivator.

QUESTION 22.—CO-OPERATION.—(*a*) (*i*) & (*ii*) By co-operation between Government and non-official agencies themselves and then by propaganda work.

(*b*) (*i*) to (*ix*) Except credit societies, a few of which exist here and there, people have no idea of the other forms of societies. But all the same these are very useful and attempts should be made gradually for their forming.

(*c*) Yes, legislation may be found useful in compelling the minority to join for the common benefit of all.

(*d*) Only to some extent. The defect mainly lies in the slack supervision of such societies.

QUESTION 23.—GENERAL EDUCATION.—(*a*) The present system of education, both higher and middle, practically has no bearing upon agriculture and much less on agricultural efficiency. There may be some nature study lessons in the primary schools but these are practically of no avail as the teachers are not themselves well trained in the art, the teachers doing only the routine work.

(*b*) (*i*) Organisation of rural societies for the improvement of rural education should be taken up everywhere. Evening classes and propaganda work both for males and females will add much help in the efforts.

(*ii*) Compulsory education in rural areas is very necessary.

(*iii*) Because they are also called to help their parents in their occupation and also the present hours of school and the distances of such schools from each other and, not the least, the expensive nature of education, are equally responsible.

QUESTION 24.—ATTRACTING CAPITAL.—(*a*) Limit further extension of tea cultivation and much of the capital will be relieved. Let the tea concerns set apart a portion of their grants for agricultural farming on scientific lines and prove successful and these examples may be followed by enterprising capitals. First of all it should be the duty of the Government to start demonstration farms all over the country run on scientific lines and yielding good income and there is no reason why capitalists should not change their angle of vision. Poultry-farming, sheep and goat-rearing, cattle-breeding, dairy-farming, fruit-growing, arrowroot-manufacturing, etc., all these are worthy of trial.

(*b*) Sheer ignorance and fear of higher assessment of land revenue.

QUESTION 25.—WELFARE OF RURAL POPULATION.—(*c*) Yes, I made a joint enquiry on the above lines with a Government official and my conclusion is that almost every year, every family falls in deficit.

QUESTION 26.—STATISTICS.—Unless there be a separate department for statistics for the Province, I am afraid, matters will not improve.

Oral Evidence.

27038. *The Chairman :* Rai Sahib Narayan Barua, you are an honorary correspondent of the Agricultural Department in the Province of Assam?—Yes.

27039. You have been good enough to provide the Royal Commission with a very interesting note and we are much obliged for the trouble you have taken in preparing the same. I understand that it will be to your convenience to speak to the Commission through an interpreter; is that so?—Yes.

27040. I turn to the note that you have prepared for the Commission. On page 197, in answer to our Question 2 (*v*), you say that if it could be practically demonstrated that agricultural farming pays as much as that it fetches a net income of Rs. 1,000 a year, it would be more attractive. Does the net return not necessarily depend upon the capital invested?—Yes; that should be the income after all the expenses are deducted.

27041. The note is so complete that I have very few questions to ask. There are just one or two points which I wish to have elucidated. On page 198 you point out that one of the difficulties in inducing the cultivators to adopt the use of bonemeal and oil-cake is the high prices. Is it your view that at the present prices the use of these fertilisers does not pay?—The prices of fertilisers have gone up.

27042. And they no longer pay; that is your view?—Yes.

27043. Is the problem of fragmentation of holdings a serious one in the districts with which you are most familiar?—Yes; legislation is necessary.

27044. Are you familiar with the districts in which the practice of *jhuming* cultivation or shifting cultivation is in use?—No; I am not familiar with it.

27045. What districts are you thinking of, when you suggest that there is a certain opening for minor irrigation schemes. You say on page 199 in reply to Question 8, Irrigation, "No systematic measures for irrigation have ever been taken in the Province although there are necessities in every district"?—Use could be made of the existing rivers and brooks.

27046. Lift irrigation from existing rivers, is that your idea?—Yes; embankments are necessary; that is most important.

27047. So as to hold up the water in small streams and utilise it in the neighbouring lands; is that the idea?—Yes.

27048. What do you mean exactly when in answer to our Question 15 (*d*), you say "certain instruments for giving occasional frightenings to the cultivators of uncompromising attitude may be found useful?" What sort of frightenings are you thinking of?—No legislation is necessary; all that I say is that hoaxing is necessary.

27049. To frighten them?—Yes.

27050. On page 201 under the heading Agricultural Labour, Question 18, is the '*Pam*' system, the system of small patches of cultivation at a distance from the village? Is that the interpretation of the word?—Yes; that is what I mean.

27051. Then how do you imagine Government could help to give protection to the cultivators in the matter of their own lives and crops and cattle?—Impounding of cattle should be undertaken and cheap fencing should be imported.

27052. The idea is that Government should help in fencing?—Yes.

27053. Are you a cultivator yourself?—Yes.

27054. How much land have you in your own hands?—About 40 *bighas* of paddy land.

27055. How long have you had this land in your hands?—For more than thirty years.

27056. What do you say about the fertility of the land when you first knew it and its fertility now?—It has deteriorated.

27057. How do you account for that fact?—Continued use of the land is responsible for it.

27058. Are you applying such manures and other fertilisers to the land as you used to apply?—It is impossible to apply manure to the entire land.

27059. Why is it impossible?—Owing to lack of labour and other difficulties.

27060. Is the labour problem a great problem on your piece of land?—Labour is not available at that time of the year when it is required. All men will be engaged in their own cultivation at that time.

27061. Do you buy any artificial manure for the land?—Yes.

27062. What class of artificial manure do you buy?—Bonemeal, oil-cake, nitrogenous fertilisers and other things.

27063. Do you find that they pay you?—Yes, I do.

27064. And if you had sufficient labour you would be prepared to buy more of them, is that the position?—Yes; for the paddy cultivation it is difficult to find labour; they want very high rates.

27065. How many pairs of bullocks do you keep for 40 *bighas*?—Four pairs.

27066. What do you feed them on in the season of fodder shortage?—Grass in the fields and straw at home.

27067. Have you ever attempted to grow any fodder crops?—Very few, Guinea grass, etc.

27068. Was that a success?—Yes, if I can cultivate it, but I cannot cultivate it.

27069. Why not?—Because I cultivate other food or grass.

27070. Do you mean it does not pay you or you cannot do it?—If I can cultivate fodder grass then it will be best for me.

27071. Will not Guinea grass grow on your land?—Yes, Guinea grass grows.

27072. Have you ever seen a method of preserving Guinea grass by what is called the silo?—Yes, I have seen it, but I cannot attempt it here.

27073. *Prof. Gangulee:* In your farming operations have you had any assistance from the Department of Agriculture?—I have merely had advice.

27074. Advice on what?—I have had twelve envelopes and twelve papers.

27075. What variety of grass do you grow on your land?—About twelve varieties.

27076. Have you received any variety from the Department of Agriculture?—No, but I have had some seed from the Government.

27077. So that besides twelve envelopes and papers you got some seed from the Government?—That was to demonstrate in the villages.

27078. What profit per *bigha* do you get from your 40 *bighas* of paddy?—No profit; it may be possible for others to make a profit but I have not made any profit.

27079. You are Honorary Correspondent to the Agricultural Department, are you not?—Yes.

27080. What are your privileges and duties?—I have no particular privilege; sometimes seeds are given to me for examination and distribution.

27081. *Mr. Calvert:* You said you made a joint enquiry into the economics of a village; how long did that enquiry take?—It was eight or nine years ago; I tried for three years. The joint enquiry was done with the help of six or seven people for six or seven days but I personally enquired into the matter for about three years.

27082. Did you find that land was being sold?—Yes.

27083. Who was buying it?—The Marwaris were the purchasers.

27084. Not other cultivators?—In the locality where I carried on my enquiries the Marwaris were the only purchasers forthcoming.

27085. *Rai Bahadur R. M. Das:* On page 202 of your note you say, "Compulsory education in rural areas is very necessary." Do you think the cultivators will consider it a great hardship if compulsory education is introduced?—They might experience some hardship in the beginning, but they will get used to it and not mind it; they are all willing to have their sons educated.

27086. Have they sufficient means to bear the cost of educating their children? Of course, in Assam, primary education is free, but have the cultivators sufficient means to buy the necessary books?—All the people have not the means.

27087. Have the majority of them the means?—The majority of the cultivators cannot afford to purchase books for their children; they are too poor.

27088. *Sir Henry Lawrence:* You say you found that the Marwaris were buying land; did those Marwaris make any profit from buying that land?—Yes, they do get a profit.

27089. Do they get that land cultivated by tenants?—No, they sell the land to tea planters at high prices.

27090. That is the only way in which they get their profit?—They do not get the land cultivated by tenants.

27091. On page 203 you ask that the further extension of tea cultivation should be limited. What is your reason for wishing to stop further tea cultivation?—The area for tea ought to be limited.

27092. I ask you why do you wish it to be limited?—In order to increase the cultivation of staple food crops; if land is being absorbed by tea, there is very little land available for cultivation by other crops, particularly food crops, rice and other things.

27093. How many acres now are occupied by tea?—I cannot tell you exactly the area occupied by tea.

27094. Is it any large proportion as compared with the area occupied by food-grains?—About one-fifth of the area occupied by food-grains is absorbed by tea.

27095. Four-fifths by food-grains and one-fifth by tea?—Yes.

27096. Would you agree that there are 4 lakhs of acres of tea and 60 lakhs of acres of food-grains; would you accept that as correct?—I am not prepared to accept that as correct because I have not got the statistics.

27097. *Sir Thomas Middleton:* You have 40 *bighas* under paddy?—Yes.

27098. You have four pairs of bullocks?—Yes.

27099. Do those bullocks do any other work except cultivate the paddy?—Yes, some other work is done by one pair.

27100. Would three pairs of bullocks be enough to cultivate your 40 *bighas* of paddy?—No, they would not.

27101. How many weeks in the year are the bullocks idle?—Not more than 150 working days.

27102. Do you breed or buy your bullocks?—Both purchase and breed.

27103. If you buy a pair of good bullocks, what does it cost you?—Rs. 85 a pair. That is just an ordinary pair of plough bullocks.

27104. When the bullocks are idle do you give them any food except rice straw and what they pick up?—No, nothing but straw.

27105. When they are working do you give them anything extra?—Some kind of rice preparation is given them; as the food is being boiled the scum comes out and that is given to the bullocks.

27106. But no kind of grain, no *dal*, of any kind?—No, no grain.

27107. Is that the custom through the whole district that the bullocks get no grain?—Grain is not given to this class of bullocks; grain is given to cows.

27108. Only if they are selling the milk from the cows?—Selling or using.

27109. How much do you give the cows?—Not more than five seers of bran and rice gruel.

27110. For how many days do you give five seers?—For two months only.

27111. But you do not mean you give five seers a day for two months; is it five seers a week?—It is given daily, not always but when it is convenient, not more than five seers.

27112. *Mr. Hezlett:* With reference to what you said as to the proportion of tea and paddy land, is not tea land higher than paddy land; is it possible to grow tea on ordinary paddy land?—By draining, yes.

27113. I do not think it is possible; have you ever seen tea growing on ordinary paddy land?—I have seen it.

27114. Well, I have not?—Not a big garden but small pieces.

27115. What is the usual difference between the height of tea land and the height of paddy land; is it one foot higher?—Tea cannot be grown on low-lying land.

27116. Tea land is quite distinct from paddy land. Do you say it is possible to grow tea on paddy land?—Not on a big scale. Occasionally paddy land is converted into tea land; that can be done. If a corner is enclosed, that can be planted with tea.

27117. How do you make it into tea land; by raising it two or three feet?—The same level.

27118. Is it not necessary that tea land should be carefully drained so that it does not get water-logged?—Yes, a lot of draining is necessary.

27119. How are you going to drain paddy fields so as to make them into tea land; where is the outlet?—By making a big drain.

27120. Where are you going to drain it into; there is no land lower than the paddy land?—Paddy land on a big scale is not fit for tea.

27121. It is only fit for tea on a very small scale?—Yes, a very small scale.

27122. You are a cultivator?—Yes.

27123. It might interest the Members of the Commission if you told us exactly what you have done yourself, whether you have made a profit from your cultivation and what crops you have grown?—I grow all kinds of useful crops.

27124. Tell us the names of them?—Paddy, mustard, pulse, sugarcane, cotton, jute, potatoes, some vegetables.

27125. *Prof. Gangulee:* All that on 40 *bighas*?—No, in the garden parts.

27126. *Mr. Hezlett:* You grow some *rabi* crops?—Yes.

27127. What area of *rabi* crops do you grow?—10 *bighas*.

27128. Do you grow mustard?—Yes, mustard.

27129. Have you ever tried sowing *masur* and mustard together in the same field?—Yes, I have.

27130. Was it successful?—Yes, *masur* and *khesari*.

27131. You got both crops?—Yes.

27132. Were both of them good crops?—Yes, both.

27133. You suggest mixing *khesari* and paddy, sowing at the same time?—Yes.

27134. Have you tried sowing paddy in the same field with *khesari*?—Yes.

27135. What was the result; did you get good crops of both kinds?—Yes, I got good crops, but I cannot say how many maunds. I am always carrying out experiments.

27136. Have you grown sugarcane?—Yes.

27137. Did you grow the new varieties?—Yes.

27138. Did they do well?—Yes.

27139. Did the jackals eat any of them?—Some kinds have been spoiled by jackals.

27140. What in your opinion is the best kind of sugarcane for the ordinary cultivator to grow?—Barbadoes.

27141. There are several Barbadoes, which kind?—B. 147.

27142. Is B. 147 a good kind of sugarcane?—It gives good crops.

27143. Is the *tana* variety a good kind?—That is also good.

27144. That does well?—Yes.

27145. Have you actually grown these canes on your own ground?—Yes, on my own ground.

27146. What new kinds of crops do you think the ordinary Assamese cultivator should grow during the cold weather and at other times of the year?—Sago, arrowroot, cassava, *masuri* of different kinds.

27147. Have you tried to grow arrowroot?—Yes.

27148. Was it a good crop?—Yes.

27149. And potatoes?—Yes, I grow some for nearly six or seven years and distributed seed.

27150. Where did you get the seed potatoes from?—I got the seed potatoes from the seed depôt.

27151. The local seed depôt here?—No, there is no seed depôt here. I suppose you got them from Gauhati.

27152. What kind of fruit trees do you grow in your compound?—We only grow mangoes and jack.

27153. And coconuts?—Yes, coconuts, but not so much.

27154. Do you grow the betel-nut tree?—Yes, betel-nuts.

27155. Do you grow *pan* leaves in your *bari*?—Yes.

27156. Do you grow oranges?—Yes, oranges and lemons grow very well in Assam.

27157. Pineapples?—Yes.

27158. What kind of pineapples?—Several kinds of pineapples.

27159. The local kind?—Yes, and several kinds distributed by the Government.

27160. You grow all these fruits, vegetables and paddy; how do you lose by your cultivation?—It is my fault.

27161. How is it your fault?—I experiment; it will ruin me but other people will in consequence make good profits.

27162. *Rai Bahadur R. M. Das:* Is it not a fact that the honorary correspondent of the Agricultural Department gets seeds at half price?—Yes, there is a rule.

27163. And yet you say they do not give you anything?—No.

27164. *The Chairman:* Would you agree that there is a growing demand on the part of a large body of cultivators in this Province to have placed at their disposal the practical methods suggested by modern

science?—Yes. May I add that the Members of the Agricultural Commission are in the position of doctors to cure the ills of the peasantry, and they should prescribe medicines for the ills of the peasants by examining their condition personally. I hope the Commission will go to the villages and see the conditions for themselves.

The Chairman: That is our intention, Rai Sahib. We are greatly obliged to you for your views. You may take it as quite certain that the interest of the cultivator is the first concern of this Commission.

(The witness withdrew.)

Mr. W. G. McKERCHER, General Manager, Amgoorie Tea Estates, Ltd., and Vice-Chairman, Assam Branch of the Indian Tea Association.

Replies to the Questionnaire.

QUESTION 4.—ADMINISTRATION.—(*c*) (*iii*) *Roads.*—Road communications in Assam are now in an appalling condition, some districts, particularly Bisnath and North Lakhimpur on the north bank, and Moran, Jaipur and Golaghat on the south bank being entirely cut off from their headquarters station during a considerable portion of the rainy season. The same remark applies to many rural areas throughout the Province.

Under these circumstances, it is impossible for those ryots who grow two crops in the year to market their produce, with the result they are entirely in the hands of local Marwaris to whom they mortgage their crops and ultimately sell them at a lower price than they could obtain in the local market.

If communications were improved and metalled roads made throughout the Province, lorries could be employed for the purpose of collecting, and as rapid transport, of the cultivators' produce to the local market.

Also free movement of the people is necessary to induce comparison and gradually promote the spirit of competition and enterprise which is so lacking in the ryots of this Province.

The metalled roads in the Province total 400 odd miles, the unmetalled about 1,200 miles.

The metalled roads in the hills total 283 miles, and the unmetalled 122 miles.

Most of the metalled roads in the plains districts are in, and adjoining the towns.

In 1912-13 the Government of India allotted grants of about 25 lakhs for the purposes of the communications of the Province, since which date no further grants have been made by the Government of India.

Prior to 1912, no steps of any consequence were taken by the Local Government to improve the communications of the Province.

From 1915 to early this year, no appreciable capital sum has been allotted by the Local Government for non-recurring expenditure on road communications.

Owing to the pressure brought by the Assam Valley planting representatives on the Local Government this year, a scheme estimated at about 15 lakhs has been entered into for the purpose of the improvement of the road communications in Assam. The Local Government, however, have given no guarantee that this expenditure will be of a recurring nature and this alone handicaps the P.W.D. in making permanent arrangements for the future improvements of the road communications of the Province.

The planting community fully realise the importance to the Province of good communications and have this year agreed to an increase of the local rate on tea lands which is expected to produce from one to two lakhs per annum for roads.

Taxation by the Central Government.—While neither Bengal nor Bihar and Orissa Governments have ever paid any provincial contributions to the Government of India, the far more backward Province of Assam is severely taxed, approximately as follows:—

		Rs.
Export duty received from Assam	30	lakhs.
Income-tax from Assam	15	,,
Import duty on tea boxes	10	,,
Petrol duty	1¼	,,
Provincial contribution	15	,,
Total ...	71¼	,,

Over and above this taxation, the Local Government have the expense of keeping up the hill districts which should be the duty of the Government of India. The annual loss in 1923-24 incurred in connection with the four hill districts, viz., Garo Hills, Khasi and Jaintia Hills, Lusai Hills and Naga Hills, amounted to nearly seven lakhs.

Besides these are the Balipara Frontier Tract and the Sadiya Frontier Tract for which I have no figure.

Export duty.—This duty of Rs. 1-8-0 per 100 lbs. was imposed on tea in 1916 with a view to obtaining increased revenue which was urgently required. The finances of the Government of India have now so much improved that there should be no reason for its retention.

The Fiscal Commission of 1921-22 in paragraph 182 laid down the principle that export duty for revenue purposes should be employed sparingly and with great caution and that they should be imposed only on articles in which India has a monopoly or semi-monopoly. In paragraph 187 the Commission held that the duty could hardly be said to comply with their condition that the article should be a monopoly or semi-monopoly and they therefore held that the export duty on tea should be removed. The Indian Taxation Enquiry Committee, 1924-25, although they accepted the Fiscal Commission's principle above stated (*vide* paragraph 154 of their report), advised the duty might continue for the present but that it should be *removed or reduced if and when the conditions of the trade indicate that it is having a prejudicial effect* (*vide* paragraph 158). They advise shutting the stable door after the horse has bolted!

"Sir Basil Blackett in the Legislative Assembly, in August last, is reported by the Associated Press to have stated as follows:—

> *"Sir Basil Blackett confessed his disappointment that the Todhunter Committee had gone back on the wiser view of the Fiscal Commission on export duty, especially regarding the undesirability of using export duties for protective purposes."*

There is no doubt the Government of India do not approve the principle of the export duty on tea but decline to abolish it owing to the loss of 50 lakhs per annum. In other words, the Province of Assam is being robbed by the Government of India to the extent of 30 lakhs per annum for the benefit of the other Provincial Governments.

Sir John Kerr in a speech at his first Durbar after his taking over charge as Governor of Assam stated that he much regretted the extent to which the Government of India were taxing the *tea industry as it precluded him from further taxing it for the benefit of the Province.*

The Assam Legislative Council have, on more than one occasion, passed resolutions recommending the Local Government to request the Government of India to abolish the duty.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(*a*) (*i*) The main cause of borrowing is lack of enterprise.

(*ii*) *Kyahs* and shopkeepers, interested in the ryots' produce.

(*iii*) Lack of remunerative occupation during nine months of the year; insufficient return from their holdings; high rates of interest on borrowed money; and increased cost of living.

Paddy cultivation is the chief occupation of the ryot in this district. He gets one crop per annum only. The average area of the plot of land held by each ryot is about three *poorahs* (four acres).

The period of occupation—cultivating and reaping three *poorahs*—is for male labour only 80 working days, and for female labour only 30 working days. Frequently the ryot has no other occupation; he depends on three months' labour for his income, and in the event of a poor crop appeals to the moneylender.

The moneylender is generally the local *kyah* or shopkeeper—who advances money to the ryot, generally for a period of three months.

Interest on loans is reported to vary from 37½ to 150 per cent. Failing repayment within the time-limit a portion of the crop is accepted at preferential rates. Estimated average yield from 3 *poorahs* is 54 maunds of threshed paddy.

	RS.
Value if sold at Rs. 3-8-0 per maund is	189
Less rent Rs. 24 and seed Rs. 12	36
Net income ... per annum.	153

QUESTION 11.—CROPS.—(*a*) (*iv*) Wild elephants are becoming too numerous and causing destruction to the ryots' crops in Nowgong, Sibsagar and parts of Lakhimpur. *Kheddah* operations are necessary.

QUESTION 15.—VETERINARY.—(*a*) I consider the Civil Veterinary Department should be independent and free from any ponderous system likely to cause delay. Epidemics require urgent action.

(*b*) (*i*) Dispensaries are controlled by Local Boards. I consider this a ponderous system. For instance, in the season in 1926, epidemics of anthrax, septicemia, rinderpest and foot-and-mouth disease were rampant throughout Assam. The mortality in some parts of the Sibsagar district is estimated at nearly 50 per cent of the herds.

(*ii*) Not adequately met.

(*iii*) I advocate the transfer of control to provincial authority.

(*c*) (*i*) Veterinary Surgeons are insufficient during periods of severe epidemics. They frequently arrive on the scene too late, the conservative ryots quickly lose confidence, and the disease is permitted to spread.

Suggest improved concentration in conjunction with animal husbandry experts.

Epidemics generally spread from one or two centres; concentration of forces might frequently prevent.

Issue literature in the vernacular on diseases and treatment.

(*ii*) Ryots are frequently slack in reporting outbreaks.

(*d*) I advocate legislation dealing with notification for segregation, disposal of diseased carcasses, compulsory inoculation of contacts, and prohibition of the movement of animals exposed to infection.

Burning of carcasses is opposed by some castes and in these cases quicklime should be available to bury with the carcasses.

(*e*) I believe there was some difficulty in obtaining sufficient serum in 1926, but it must be remembered the demand for serum was very much in excess of normal years.

(*f*) No fee is charged for inoculation.

Lack of faith in the treatment is the chief obstacle.

Procrastination is responsible for many fatal cases.

(*g*) I do.

(*i*) I have no knowledge regarding Muktesar Institute.

(*ii*) I recommend provincial veterinary research institutions.

(*h*) Yes, by research officers in the Provinces.

(*i*) I do not recommend the appointment of a Superior Veterinary Officer with the Government of India but I consider the Government of India should assist the Provincial Government more liberally with funds.

QUESTION 16.—ANIMAL HUSBANDRY.—(*a*) (*i*) I suggest the employment of travelling breeding experts in conjunction with Veterinary Department if possible, and expert castration of all weedy bulls and importation of

desirable breeds of bulls. Imported bulls should be stall-fed and not allowed to roam with herds, wearing themselves out for no practical purpose, and risking diseases very prevalent on general grazing grounds.

The *gaonbura* of the village might be responsible to the travelling expert for the bull, charging the ryots a small fee for service, towards the cost of upkeep. The bulls should be the property of Government. Periodical exchange of bulls from one district to another would tend to improve the breeds of cattle.

(*ii*) I suggest a grazing area for each village to prevent disease spreading, improved breeds of cattle and pastures.

Metal roads and motor transport are also very important factors, as during eight months of the year Assam roads are impassable and the ryot has no market for his produce, if produced.

(*iii*) Expert advice including veterinary treatment by lectures; also the issue of literature written in the vernacular.

(*b*) (*i*) Grazing areas are insufficient, badly distributed, and the pastures very inferior, frequently consisting of plots of waste land not required for any other purpose.

To the best of my knowledge, manures for improving pastures are never applied.

(*ii*) Paddy fields are flooded during the crop season. The Government roads may provide a little grazing, otherwise the cattle must travel to the grazing ground, sometimes a couple of miles distant. After the crops are reaped, cattle wander over the rice fields.

(*iii*) A limited supply of paddy straw is available.

(*iv*) The Assam dry weather is usually not very severe on pastures.

(*v*) Lack of lime in Assam soils is supposed to be responsible for the small bone in Assam bred cattle. Expert opinion is desirable on this point.

NOTE.—I consider Government assistance in animal husbandry is most essential and together with roads first in importance for the welfare of the Province.

In spite of large herds, milk is difficult to obtain. Swiss milk is freely imported into the Province.

Cream on the milk produced by the Assamese cow is a stranger, and butter unobtainable.

One of the chief difficulties in obtaining extra grazing grounds at convenient centres is due to opposition from the ryot, who cannot afford to give up any part of his small holding for the benefit of his neighbours.

As it is desirable for each village to have its own grazing ground in order to limit the spreading of disease, liberal terms for land acquired are essential.

In Sibsagar district, during 1926, the loss of cattle due to epidemics will probably exceed any previous record.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(*a*) *Paddy cultivation.*—Suppose the average ryot cultivates three *poorahs* of paddy (usual work for one pair of bullocks). In June, a plot for seedlings is prepared which provides employment to one man for fifteen days. In July-August, the area to be planted generally requires ploughing five times, each *poorah* occupies three days of about two to three hours' work per day. Planting done by female labour occupies four days per *poorah*. Reaping is also done by female labour at four days per *poorah*. Carrying and storing by male labour, say, twelve days for three *poorahs*.

Male Labour—	Preparing seedlings	15	days.
	Ploughing 5×3×3	45	,,
	Carrying and storing	12	,,
	Fencing and repairs to bunds	8	,,
	Employment for a man per annum ...	80	,,
Female Labour—	Planting	12	,,
	Reaping	12	,,
	Employment for woman on holding ...	24	,,

Occupation during slack season practically *nil*.

(*b*) Encourage the weaving of Assam silk by planting *soom* trees on the waste land surrounding villages—rent free until the trees reach the producing age.

There is a good market for poultry and goats which do well in Assam.

Sheep-rearing is too risky on our damp soils for the ryot's capital.

(*c*) The increasing scarcity of fish in the Province indicates the necessity for enquiry into the preservation of small fry by—

(1) a fixed size of mesh for fishing nets;
(2) prevention of the use of poison in rivers.

QUESTION 18.—AGRICULTURAL LABOUR.—(*a*) (*i*) and (*ii*) Obtain the whole-hearted support of Provincial Government, to encourage emigration of their surplus labour to the tea gardens which depend entirely on imported labour both for the cultivation of existing areas and the extension of new areas.

The above applies both to permanent settlement and seasonable migration.

(*b*) The principal factors in the shortage of labour in Assam tea gardens, and the recruitment of labour are—

(1) The loss due to the rapid colonisation of Assam by time-expired tea garden coolies.
(2) Expansion of the industry.
(3) The All-India influenza epidemic seriously reduced the agricultural population both in Assam and throughout the recruiting districts.
(4) (*a*) No famine in the recruiting districts during recent years.
(*b*) Expansion of railways and industries increasing the demand for labour in the recruiting districts.

NOTE.—The area settled with time-expired coolies in the Assam Valley (including Sadiya and Balipara Tracts) is approximately 290,261 acres—a larger area than the whole area under tea in the Assam Valley. (The area under tea in 1923 was 266,866 acres.)

In the Surma Valley approximately 35,307 acres are settled with *ex*-tea garden coolies. (The total area under tea in 1923 in the Surma Valley is given as 144,941 acres.)

(*c*) Waste areas are being rapidly filled by *ex*-tea garden labourers and immigrants from Eastern Bengal and Nepal.

QUESTION 19.—FORESTS.—The danger of a scarcity of thatch and firewood in the near future, requires consideration, in the interests of the poorer class of ryots.

In the neighbourhood of many villages, afforestation and thatch-reserves are desirable before scarcity becomes too acute.

The *jhuming* system of cultivation should be stopped.

The growing of sugarcane will quickly impoverish the soil unless manures are applied. Some form of limitation is desirable, to prevent exploitation.

QUESTION 21.—TARIFFS AND SEA FREIGHTS.—I consider the import duty on galvanized corrugated iron and building materials is a severe hardship on the Indian cultivator in districts where thatch is unobtainable.

Oral Evidence.

27165. *The Chairman:* Mr. McKercher, you are General Manager of the Amgoorie Tea Estates, Limited, and Vice-Chairman of the Assam Branch of the Indian Tea Association?—Yes.

27166. Do you wish to make any statement of a general character at this stage or shall I ask you one or two questions?—I have submitted my general remarks in writing. You may ask me questions.

27167. I see under the head 'Roads' you complain of the state of roads in this Province. I should like to know how long you have been in this Province?—Thirty-two years.

27168. Are the roads better or worse as compared with their condition when you first knew them?—I would not say they are worse as compared with their condition when I first knew them; but within the last ten years they have grown worse.

27169. What is the reason?—The cost of labour has doubled and the allotment for roads has grown small accordingly; and also motor traffic is increasing.

27170. Would you say the state of the roads places a burden and handicap on the tea industry?—Yes, I would.

27171. In what way?—For getting about, for everything.

27172. I might have put my question another way; is the state of the roads so bad that there is difficulty in getting the tea either to the ports or to the railways?—No; we generally use our own independent tram lines; but anybody using the roads will find a difficulty.

27173. It is in the ordinary business of management and the general conduct of life that these roads handicap the industry?—Yes.

27174. Are you familiar with the working of the local authority in relation to its responsibility for the roads?—Yes; I am a member of the Local Board, and also on the Finance Committee.

27175. What is the position of the Local Boards?—They are always handicapped for money. I know of one district in which only one brick bridge has been constructed for the last thirty years over an area of twenty miles square. All the money we get has got to be used for filling up the holes.

27176. Have you any constructive suggestions to make for remedying this unfortunate position?—Only what I have written.

27177. Nothing beyond your note?—I should like to point out that, taking an average yield of eight maunds per acre, the export duty on tea from Assam and the import duty on tea boxes work out to Rs. 12-12-9 per acre.

27178. What about the roads of the District Board of which you are a member?—I am from the Sibsagar district. I am referring in my written evidence to the Public Works Department roads, not to the second-class roads.

27179. You are giving the mileage of Public Works Department roads, not District Board roads?—There are about 3,000 or 4,000 miles of District Board roads; I am not referring to that.

27180. You mention the question of the provision which Government have made this year, but you say there is no guarantee that this will be of a recurring nature. Was there any suggestion that it should be of a recurring nature?—Well, Government could not promise. We asked the Member at a meeting the other day, and he said he could not make any promise. He is as handicapped as the others.

27181. You have come to the point where you think that further taxation is essential?—I do not say that. But we have come to the point where I consider that Assam should get more from the Central Government.

27182. I am looking to your own words, on page 208, "The planting community fully realise the importance to the Province of good communications and have this year agreed to an increase of the local rate on tea lands." To that extent I was right, I suppose?—Yes. But I would like to push home the other point. Assam gets nothing from the export duty on Assam tea, which is 30 lakhs. Then there is the income-tax 15 lakhs; import duty on tea boxes 10 lakhs; petrol duty 1¼ lakhs; provincial contribution 15 lakhs; total 71¼ lakhs. The Assam ryot cannot afford to pay more revenue. The only industry in Assam is the tea industry, and the Central Government takes away the lot.

27183. You refer on page 209 to the abolition of the export tax on tea. If this tax were admitted to the provincial revenues, do you think that there would be any objection to the paying of it by the tea plantations?—I am not in a position to say that. I say we have been fully taxed and we cannot help the Province. I should not like to take any responsibility for answering your question.

27184. On the question of Agricultural Indebtedness, on page 210 you give figures as to seasonal lack of employment and you say, "The period of occupation—cultivating and reaping three *poorahs*—is for male labour only 80 working days and for female labour only 30 working days." How did you arrive at these figures?—From practical experience. I have been thirty years in Assam; our own coolies get a lot of land, they have 1,071 acres which they cultivate round the gardens, and I know a great deal on that subject.

27185. Is malaria prevalent in the districts with which you are most familiar?—It is seasonal. In some years we get more than in others, but our death rates are not high.

27186. Can you estimate the number of days during which the average ryot is laid up?—I can give our own figures of actual attendance if they will be of any help.*

27187. They might be useful. Is it a long table?—No. I may give the average of the nine months from January to October. The average percentage working for one garden is, men 79, women 58, children 73; for another group 82, 64 and 68; for a third, 68, 68 and 79; for a fourth, 85, 75 and 84. During advanced pregnancy and on wet days women do not work. So, that has to be calculated in the case of women.

27188. You are familiar, I think, with the work that is being carried out at the moment under the direction of Dr. Ross?—I am not in that district, but I have been to his lectures.

27189. But you know about his efforts?—Yes.

27190. Do you think it is possible to apply his methods to the ordinary zamindari or ryotwari districts?—I do not think so; they are expensive.

27191. Do you think any efficacious methods exist which might be applied to typical rural areas?—The Assamese villagers in the plains do not suffer from malaria to the extent that the coolies in the gardens do. This draining is a peculiar thing. I am very sorry to say that I am not in favour of draining these areas. If you do, you will be ruining their rice cultivation.

27192. Malaria is a more urgent problem with the jungle tribes?—Yes, in the jungles. I listened very carefully to Dr. Ross's lecture the other day at Dibrugarh, and I made up my mind that I should not touch his methods; I should rather depend upon our doctors. We have got 12,000 acres, and at £1-10-0 per acre for draining and maintenance we should have to spend £18,000 in two years, not to mention the labour which the gardens have to supply themselves. After drains are cut, they must be kept clean and cavities treated with oil. It is an impossible proposition in a large area.

27193. You do not think this plan is practicable in the case of a typical area, and you do not feel disposed yourself to undertake it on your own tea estates?—I will do it in a limited degree as regards jungles, but I cannot divert 50 per cent of the labour and establishment for the work.

27194. Is shortage of labour one of the pressing problems of the tea industry to-day?—Yes.

27195. On page 212 you give a list of some of the causes of that shortage. Are they in the order of their importance? Is the first "The loss due to the rapid colonisation of Assam by time-expired tea garden coolies" the most important?—Yes. I would not put (2) "Expansion of the industry" before (3) "The All-India influenza epidemic."

27196. Take the first, "The loss due to the rapid colonisation of Assam by time-expired tea garden coolies." Would you suggest any remedy for that?—No; I cannot. It is only a natural thing.

27197. (2) "Expansion of the industry", there is no remedy for that, I suppose?—No remedy.

27198. (3) "Influenza epidemic", what about that?—That is finished; I hope it will not recur.

27199. (4) (*a*) "No famine in the recruiting districts during recent years"; we can hardly arrange for famines?—No remedy for that.

27200. (4) (*b*) "Expansion of railways and industries." From the All-India point of view you can hardly deplore that?—No; I have nothing against that.

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* *Vide* Appendix I.

27201. Have you any concrete or constructive suggestions to put before the Commission for the amelioration of this position?—I think we require the whole-hearted support of the Provincial Governments, because we all know that cheap labour is a very useful thing in all the different Provinces. I think if the Government would trust us as regards recruitment, it would help us. There are many restrictions at present and we are trying to get those removed. We are not always trusted. Act VI has been practically abolished; a few recruiting clauses are all that remain of it; we are trying to get new rules.

27202. Is it really an attempt to re-establish mass recruiting under proper control?—Yes.

27203. At the time when the new legislation came under criticism and the rules were passed, did the Tea Association exist?—Yes.

27204. Is it your view that the Association was such as to be in a position to give guarantee that it would bring disciplinary action to bear on members who were in default in carrying out the undertaking given to Government?—Do you mean as regards the new proposals? Have you seen those?

27205. I am asking you in general terms, whether the Association can step in and take the responsibility?—We are proposing to have a Recruiting Board, if it is sanctioned; that I think will take full responsibility.

27206. As an Association?—Yes. Government will have a control and will have an official Chairman on the Board.

27207. Are you not a little drastic when on page 212 you say, "The *jhuming* system of cultivation should be stopped?"—I am afraid the deterioration of the jungles is so rapid in Assam and firewood is becoming so scarce that it is necessary. These people burn the trees in a small area, cultivate it for one year and then leave it and go to another area. They do not even use the trees; they burn them.

27208. Do you agree that those tribes who are in the habit of obtaining a living by the *jhuming* system should be taught the art of creating minor irrigation schemes?—I think so.

27209. In fact, it would make a considerable contribution towards the solution of this problem?—I think so. They are an amenable group, although some of the Nepalese are very bad.

27210. It might be possible to terrace some of these lands brought under *jhuming?*—Yes. At present the practice does a lot of damage.

27211. Do you know whether there is any technical officer competent in the art of irrigation whose advice would be at the disposal of cultivators or villagers anxious to adopt any such scheme as we are discussing?—I do not think so.

27212. On the same page you suggest that the fishing might be improved by the prevention of the use of poison in rivers. Is it a common custom?—The hill tribes poison the rivers and kill the whole of the fry. Fish is getting more and more difficult to obtain.

27213. What do they use?—*Naga-bih* and *Khoni-bih*. The former is a poisonous creeper. The latter (aconite) is like a small egg. They put these in the rapids right across the river and *Khoni-bih* is dangerous. *Bih* signifies poison.

27214. Coming to a very different subject, you are familiar with the research work being carried out by the Indian Tea Association?—Yes.

27215. Have you interested yourself at all in any of the technical details of that work?—In what way?

27216. Do you know whether there are certain problems of fundamental importance and general application which are being investigated at the moment and others which require investigation, which in the view of some responsible people might very well be undertaken by the Central Government's institution at Pusa?—I would not care to answer that; I leave that to Mr. Carpenter.

27217. *Sir Thomas Middleton:* On page 211 you give the details of the time occupied in rice cultivation, and you estimate the amount of time required to plant an acre of paddy?—I have taken three *poorahs* of paddy, that is the usual area for one pair of bullocks.

27218. You estimate four days per *poorah* for planting; that is, three days per acre?—Yes. That is for planting and cutting. I have talked to the villagers, and that is what they allow.

27219. That is woman labour?—Yes; planting is woman labour.

27220. When you come to ploughing, you have got 45 days for three *poorahs;* that will be 34 days for ploughing three acres?—Yes. It is practically 11 days per acre. In England they plough one acre in one day. (One man and two horses.)

27221. How many ploughings do you allow them?—Five.

27222. That gives about 11 days for five ploughings per acre. That is about two days an acre for one ploughing?—About two and a quarter days.

27223. I have been comparing your man and woman labour. Your women seem to work faster than your men?—Yes. Generally the women carry loads on their heads when the men go without any load.

27224. What I gather from your figures is that women show relatively a high efficiency in your area?—That is so; but, on the other hand, they work a smaller number of days in the year. Another thing that I can tell you is that when you commence planting, you cannot wait for the water to dry up though you can do the ploughing as you like.

27225. I only wished to clear up this point about the relative efficiency?—I am glad to be able to help you; I am keen on it myself.

27226. *Dr. Hyder:* What is this rate to which you are referring, to which the Tea Association has agreed? Is it the acreage rate of 8 annas, or is it the local rate?—I cannot tell you anything about the 8-anna rate at all; I think it was discarded; we shall now voluntarily pay 5 annas.

27227. That is the additional rate to which you are referring? Was not the 8-anna rate thrown out in the Council?—This is the rate of 5 annas per acre that was proposed last September; it is the latest.

27228. With regard to the taxation by the Central Government, do you get anything at present from income-tax?—I think Assam gets so much for collecting it on behalf of the Central Government.

27229. Do you not get anything when it exceeds the datum line of 1921?

Mr. Hezlett: The Central Government pay for the cost of collection, *plus* 3 pies in the rupee above the datum line, which accounts for a good deal of the revenue in Assam, because a new method of assessment was introduced in regard to tea since 1920-21. Tea is now assessed at 25 per cent of the profit; 25 per cent is looked upon as the manufacturers' profits and 75 per cent as the agricultural profit.

Dr. Hyder: You do get something from the difference, and you are not in the same position as other Provinces?

27230. *Mr. Hezlett:* We get more from income-tax in proportion to the total realised from income-tax, because of the new method of assessing the tea industry?—That is another imposition. You may say that we have a factory, simply because we have got a steam-engine or something, and just get more money out of us.

27231. With regard to this matter of Rs. 71¼ lakhs, you share this misfortune with other Provinces in India; that is what you pay to the Central Government? You pay income-tax, export duty and import duty?—I have made a note of other taxes that we have to pay.

27232. The export duty received from Assam is Rs. 30 lakhs, and the income-tax from Assam is Rs. 15 lakhs. These are misfortunes which you share with other Provinces?—I should like to point out that there is an additional import duty on tea boxes which with export duty comes to Rs. 20 per *poorah*, and on the top of that we pay other rates.

27233. The petrol duty is also a misfortune which you share with others?—Yes, but I would give it to the Imperial Government and take the rest.

27234. What do you include in this figure of Rs. 71¼ lakhs? Does it include the pay of Political Agents, the maintenance of some irregular force, the cost of policing the frontier districts?—Yes; the frontier tracts are run at a loss; they cannot pay their way; the rest of the Province has to carry them and pay these taxes that I have mentioned.

27235. Nothing is contributed towards that by the Central Government?—To the best of my knowledge, no.

27236. Is anything paid by the Central Government towards the maintenance of the Assam Rifles?—Might I ask you whether the other Provinces on the North-West Frontier pay towards the maintenance of the Army?

27237. This is the point on which I expressed agreement with you?—I think we are greatly handicapped; our Government have not got the power to do their work in an efficient way.

27238. This is an Imperial charge, and ought to be met by the Imperial Government?—I think the Imperial Government should be more merciful to us.

27239. With regard to the export duty, if the Central Government washed its hand of this duty, what are you going to do? Either you are going to put an acreage rate, or you are going to have some kind of export duty on tea passing down the Brahmaputra?—I think if the export duty were removed, we should be able to help Assam.

27240. The only two ways are either an additional acreage duty or an export duty on tea grown in Assam? Is there any third way?—If we are relieved from Imperial taxation (these two are not fair taxes in our opinion) we should be in a better position to help the Assam Government. If they repeal this export duty, which they must sooner or later, the Assam Government would get a greater revenue from us.

27241. The point is this. You refer to the Taxation Committee's recommendation to continue the duty for the present. If this duty were removed by the Central Government, and the Assam Government imposed an acreage rate or an export duty, it would be like putting pig on pork. It is just the same thing, so far as you are concerned?—No; Assam would develop.

27242. The whole point is with regard to its being sound or unsound. If your view is accepted, then it would become a matter as to who gets the duty? At present the Central Government gets it?—At present it does; in the other case, the Assam Government would get it.

27243. In that case, it would be more or less a transfer of funds? The nature of the duty imposed, of which you are complaining, would not be altered?—Capital makes capital.

27244. On page 209 of your memorandum, you have quoted an extract from the speech of the Finance Member. Does the export duty on tea protect the tea industry? It is a revenue duty, is it not? You have stated that the Finance Member was reported by the Associated Press as having said "Sir Basil Blackett confessed the disappointment that the Todhunter Committee had gone back on the wiser view of the Fiscal Commission on export duty, especially regarding the undesirability of using export duties for protective purposes." I ask you whether this export duty on tea has the effect of protecting the tea industry?—I do not quite follow you.

27245. What is the meaning of this quotation?—That is an extract from the speech of Sir Basil Blackett, taken from the paper, in which he agrees with the views of the Fiscal Commission.

27246. The only point I am concerned about is this: what is its relevancy to the tea export duty?—I think it is generally agreed that the tea export duty is scarcely fair. It was a War measure, and when the War was over, it should have been removed; there is no doubt about that, but we have not been strong enough to get it removed.

27247. Is it doing you harm?—Undoubtedly.

27248. Are you losing markets?—We are handicapped in the Province.

27249. That is one difficulty?—We are the black sheep of the Province; though we pay treble the revenue and taxes, still we are useless to the Province; that is the Assamese view.

27250. Are you being handicapped in foreign markets through this duty?—I would not say foreign markets, but we have been handicapped in expanding our industry and everything else.

27251. What is your present system with regard to the recruitment of labour?—The system of the *sardar*, principally.

27252. You do not approve of it?—I approve of it, but we should like to have a cheaper system. The *sardari* system is very expensive. With

the numerous taxes we have to pay, it comes to a cost of about Rs. 200 per coolie. We have to send the *sardar* down to start with; we pay a cess to the Local Government for sending him, a license fee of Rs. 3; in addition we have to pay a capitation fee of Rs. 15 for the *sardar* to Indian States and Rs. 5 to the Association. For every immigrant we have to pay Rs. 5, and a cess of Rs. 3; then there is the Tea Districts Labour Association capitation fee of Rs. 15; there are also other overhead expenses; for clothing we have to pay Rs. 12-8-0 for an adult and Rs. 4-4-0 for a child.*

27253. What specific points do you complain of in the present system?—I think there are too many restrictions, some of which should be done away with.

27254. Could you name them?—Registration before the Government; they are Government restrictions; we have to send the *sardar* down to import immigrants.

27255. How did you do this before?—In the old days they came to us through contractors; they gave us a black name; since then it is always done through the *sardar*.

27256. *The Chairman:* Dr. Hyder and you have been discussing between you this question of the quotation from Sir Basil Blackett's speech in the Legislative Assembly, of which you have given an extract on page 209 of your note; are you sure that that is a correct rendering of that speech?—It is in our records; we got it from a newspaper.

27257. I have not the context in my mind. How do you use an export duty for protective purposes? I am concerned with Sir Basil Blackett's argument?—I suppose it is to assist paying for others; you know there are these subsidies and things of that kind; that is how I read it.

27258. Do you mean that the revenues resulting from this export tax were to be applied to the granting of subsidies to some other industries?—That is how I read it. It is rather a round-about rendering.

27259. *Mr. Hezlett:* You say that the chief problem in this country is one of better roads; I suppose you are aware that a metalled road in Assam costs Rs. 20,000 per mile?—Yes.

27260. Therefore, it is a very expensive job, which is beyond the finances of the Province for many years to come. Have you ever considered any system of keeping the *kutcha* roads in better condition?—It is a question of having more money.

27261. Do you think that the money which the Local Boards and Government spend on roads could not be better spent than it is at present?—You have been in Assam for many years, and you know that in the old days we got Rs. 100 per mile for first-class roads and Rs. 50 per mile for second-class roads; we are still getting money at the same rate, but the cost of labour has more than doubled.

27262. The revenue of the Local Boards has not increased but the cost of labour has risen?—Yes. The Local Boards are always starved, and they are handicapped just as much as Government.

27263. Have you ever noticed, going along any of our roads, that some portions of the road here and there are quite good? No matter how bad the road may be, you find some parts quite good?—Yes.

27264. What, do you think, is the reason for that?—The soil, and also the traffic.

27265. But the same traffic goes all over the road?—Yes; it may be due to *pan* on the sandy soil.

27266. Could not the Local Boards analyse the soil at those particular places and find out the proportion of sand and clay, and get better roads by mixing sand and clay in the same proportion?—Do you not consider it would cost just as much as metalling the road? Besides, you have to remember the rainfall, which washes down the soil to the extent of six to seven inches in the year. If you put bricks in holes of that depth, you will find that in a couple of years, all the soil is washed down, and that is the highest place; I have personal experience of it. As one of the engineers stated last year, if you make an improvement this year, it is washed away by the next rains.

**Vide* Appendix IV.

27267. Metalling costs so much, that is the difficulty?—Capital makes capital.

27268. You mention the fact that the Assam Government has to keep up five hill districts at great expense. Are you aware that the Government of India pay most of the cost of the Assam Rifles?—What is the cost?

27269. The total cost is Rs. 17½ lakhs; are you aware that the Government of India pay Rs. 16 lakhs?—They make Rs. 70 lakhs out of us, they could still allow us a little more money.

Yes; they could give something. I only gave you the figures from memory; I cannot guarantee their accuracy.

27270. You mentioned that you had some idea of *jhuming;* do you think that *jhuming* should be stopped?—Yes.

27271. What other form of cultivation would you suggest these hill tribes should take up?—I think they should be made to stick to their own land. There used to be very fine forest land slopes which have been damaged; I think they are wasting their land, and it must affect the rainfall sooner or later.

27272. *The Chairman:* Is it reducing the rainfall?—We think that the absence of forests reduces the rainfall on these hills.

27273. *Prof. Gangulee:* On page 208, you say, "Under these circumstances, it is impossible for those ryots who grow two crops in the year to market their produce." Are there many people in the neighbourhood who can grow two crops?—It is not worth the trouble. The cultivator will have to carry the produce on his back a long distance to the market, which he cannot do.

27274. You suggest that they can grow two crops, and that the other conditions are favourable for it?—I do not see why they should not; of course, I do not say paddy and another crop; at present they can take part of the area for one crop and part for another, and thus grow two crops.

27275. You do not suggest that the other conditions are quite favourable for two crops?—I have no experience of that. The great thing about paddy land is that you must not break the *pan* beyond a depth of six inches. By taking a certain area of the holding for one crop and another for another crop, it would pay them, if they could get rid of the produce.

27276. The only handicap is absence of better communications?—That is my opinion.

27277. *The Chairman:* Does not the importance of the *pan* depend almost entirely upon the nature of the sub-soil?—Yes.

27278. In some areas, you can afford to break the *pan* with impunity?—I would not say that for rice cultivation.

27279. *Prof. Gangulee:* In the tea garden districts, the other conditions are quite favourable for two crops, and only lack of better communications prevents them from going in for it?—That is my opinion.

27280. In the next sentence you say, "They are entirely in the hands of local Marwaris to whom they mortgage their crops." Are the cultivators compelled to mortgage their crops only because of the absence of better roads?—You are asking me a very pointed question. I consider that there is certainly a lack of better roads, and I certainly think it has a great deal to do with handicapping the improvement of the condition of the people.

27281. But the other conditions may be such that they are perhaps compelled to mortgage their crops to the Marwaris in any case, whether there are good roads or not?—I think they would get a better market if there were better roads.

27282. Do you get temporary labour in the tea districts?—Yes.

27283. What proportion of the total labour force in the tea districts may be put down as permanent settlers?—Taking the average attendance at work in 1925, the figures are permanent labour 46,221 living on the gardens; labour that was more or less living on the grounds was 30,252, that is what we call permanent outside labour. The outside imported labour, from Lower Assam and Cachai hills, etc., was 36,023.

27284. That was temporary labour?—Yes, from three to six months.

27285. It may be that they worked on your estates during their period of unemployment?—Yes.

27286. You depend for the tea industry more on temporary labourers than on permanent labourers?—We depend more on permanent labour.

27287. Are these labourers, who are permanently settled, recruited from aboriginal tribes?—They are all imported.

27288. From Chota Nagpur?—Yes.

27289. What are the average rates?—I have handed in two statements, one of which is the average monthly earnings in our plantations which is rather interesting compared with family budgets of cotton mill workers in Sholapur. The other is concerned with the efficiency.

27290. *The Chairman:* Of the two tables, table A* relates to efficiency; is the percentage of daily attendance the measure of efficiency?—Yes.

27291. The table marked B† is the average monthly family earnings for 1926; that is for one man, one woman and one boy?—Yes. Sibsagar district is about the average for Assam; in Lower Assam it may be a little lower and in Upper Assam it may be a little higher.

27292. *Prof. Gangulee:* I know very little about the various systems of wages that you follow here. There is such a thing as *hazari*?—It is an old Assamese word for the first period. In the old days every one went out in the morning for two or three hours for their *hazari*; in the afternoon they again went out and did *ticca*, that is overtime.

27293. The permanent labourers get *hazari* and *ticca*?—Yes; in various gardens we pay a good deal for extra work done. Some of them do it, others do not.

27294. Besides *ticca*, is there not also a unit system? What is that?—I think that will be the future system; you give so much for each unit of work and they can do as much as they like.

27295. That system is applicable both to the permanent and temporary labourers?—We apply it to every one.

27296. There is no difference between the permanent and temporary labourers?—I am inclined to pay my permanent labour a little better than the temporary labour, because they have to go out on wet days as well as on dry days, but the usual thing is about the same for both.

27297. *Dr. Hyder:* What is the existing machinery for the control of recruitment?—There is the Labour Board.

27298. Is it appointed by the Government of India?—There is a Government official who is the Chairman; there are so many men from Calcutta Agency Houses and so many men representing the gardens; I am one of the latter; *I think there are four others.*

27299. *How many representatives from Government?—One official of* Government *who is the Chairman. At present he is Mr. Austin, a Madras* Civil Servant.

27300. *Prof. Gangulee: That is the machinery which controls your* recruitment?—Yes.

27301. Is the *sardari* system still going on? Is recruitment still done only through the *sardar*?—Only through the *sardar;* but we are asking Government, in times of distress and famine to send labour up through the Tea District Labour Association local agents, under the sanction of the Labour Board. The Labour Board has nothing to do with recruiting; it is a controlling Board, to stop anything going wrong.

27302. In your reports, I find some such statement as this: "Season 1925-26; *sardars* sent recruiting, 17,123 coolies; coolies recruited 10,374." It seems to me these coolies are recruited from those that are sent by the *sardar*?—The coolies are recruited by the *sardar* and sent through the agency, which is the Tea Districts Labour Association, and we have to pay them Rs. 15 for every coolie towards upkeep of the Association.

27303. Do you suggest that the restrictive legislation passed by the Government of India has in any way hampered the operations of the tea industry?—No, I would not say that; but it has prevented expansion.

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* *Vide* Appendix I. † *Vide* Appendix II.

27304. Is expansion desirable in the tea industry at the present moment?—Personally, I should say, no for myself, but for the country, certainly yes. It might reduce our profits for a year or two, but eventually I think India could drink much more tea than it does.

27305. You think the demand justifies further expansion?—Certainly; I am not talking of the prices at this moment, they are rather low; but generally, yes.

27306. On page 210 you say that the moneylender is generally the local *kyah* or shopkeeper and further down on the same page you say that his rate of interest varies from 37½ to 150 per cent?—Yes; it is from 2 pies in the rupee to 2 annas.

27307. Do you have shopkeepers in the tea estates? By whom are they settled?—We have one or two shopkeepers in each garden; it depends upon the size of the garden.

27308. They are allowed to come there and open their shop by the tea estate?—Yes.

27309. On what conditions do they settle down there?—They pay a nominal rent.

27310. You have no control over them?—I have; they dare not charge interest from my coolies. I have, of course, referred to the case of ryots in my note.

27311. Your coolies have no transactions with them?—No; if we hear of any extortion, we sack the *kyah*.

27312. Are you aware of the basis of the transactions which pass between the coolies and the shopkeepers?—I have known coolies borrowing money from the shopkeeper.

27313. On what rate of interest?—Up to 2 annas in the rupee; that comes to 150 per cent.

27314. So, the coolies borrow money from the shopkeeper?—I have known it. Of course, we pay our coolies every week and therefore they are not in need of borrowing money. In the old days, when we used to pay them at the end of the month they used to borrow money.

27315. *Dr. Hyder:* How long is it since you have started paying them weekly?—We started this weekly payment system about a year and a half ago.

27316. *Prof. Gangulee:* So, the arrangement of paying weekly wages has reduced the indebtedness?—Yes; but you cannot reduce the indebtedness of the ryots and I am here talking of the ryots. Of course, the weekly payment to our coolies has certainly stopped the borrowing of money from these *kyahs*. If the *kyahs* try to lend money, they will be turned out.

27317. Is this system of weekly payment followed in all your tea gardens?—Yes.

27318. With regard to the education of the children of the coolies in the tea gardens, I heard in Calcutta that you were offering a compensatory allowance to induce coolie children to attend schools; is that practice in operation now?—We all have schools, but children go for a few weeks and then leave off going. They prefer to pluck tea leaves with their mothers.

27319. Do you offer compensatory allowance for each child?—The midday free meal provided by the garden to non-working children might be used in this manner. Personally I provide the free meal to all non-working children independent of attendance at school. Schools are not popular with coolie children or their parents. A common excuse for non-attendance is to complain against the schoolmaster. I have changed numerous schoolmasters but the children get tired of school in no time and I have found it no good.

27320. You could not influence the parents of these children?—Some thirty or forty children do go to the schools. I have seen twenty children in one school, but they never exceed that number. They do not stay for long. We are dealing with "Free Labour".

27321. So there is an effort on your part to induce the coolies on your tea gardens to send their children to school?—Yes, we supply schools and schoolmasters for them but I do not go and fetch them out of the lines; I have done it occasionally.

27322. *Mr. Calvert:* With regard to this question of weekly payment of wages, is it now generally done on the tea estates?—Some estates pay fortnightly but I think weekly payments will become general. It seems rather popular now and I am very much pleased with this system.

27323. Does it cost you much?—It is more troublesome because I have to fetch the money from the treasury four times a month instead of once or twice.

27324. Does it not involve more labour for keeping the accounts up to date?—The labour is cheap in that respect. I would not put any extra expense on that score; I am very keen on it.

27325. You think it has really removed the cause of borrowing?—Certainly. In the old days when the coolie used to get his monthly wages he used to spend it quickly and used to borrow money for his drinks on Sunday nights. There is no necessity to borrow money now because he gets his payment on Saturday night or Friday night and he is in a position to pay for his drinks.

27326. That is exceedingly interesting. There was a resolution in the Assembly and we could not persuade the Government of India to agree to the payment of weekly wages?—We have done it and I like it.

27327. Your experience confirms the experience of England and most other European countries that the weekly payment system is the best from the labourers' point of view?—Yes. The spendthrift has always got only a little by him.

27328. *Dr. Hyder:* The Railways refused to pay weekly wages because they said it taxed them too much to introduce that system?—I have no experience of Railways.

27329. *Mr. Calvert:* With regard to the question of those who grow two crops and are unable to market their produce, I suppose you mean the surplus produce which is not a very large fraction of the total?—It is not at present.

27330. The average holding is from three to six acres, so that the man usually has a small fraction of surplus produce?—At present it is so. The usual practice is to reckon that a man and his wife require one maund of rice per month; 18 maunds of paddy, or 12 maunds of rice, per *poorah* is the average yield; so you can soon calculate and find out the surplus.

27331. I do not quite understand why the difficulty of marketing a small fraction of the total produce should deter him from growing the other portion?—If he grew more, how would he get rid of it; he could not eat more.

27332. Cannot he consume more?—No.

27333. Does the export duty on tea have any effect on the price obtained for tea for internal consumption?—I do not think it has and I do not know how it can have any effect. The export duty is on tea we ship to London; on the tea sold in Calcutta there is no export duty.

27334. This export duty does not make you sell internally at a lower rate?—No.

27335. If you are paying an export duty, you are thereby losing to that extent the advantages gained from the foreign market?—We lose on that account in cash, so, it does interfere with our profits. We have been having two or three good years but they are coming to an end now.

27336. As far as the bringing down of the price of tea for internal consumption is concerned, it will have no effect?—I do not think it will.

27337. *Dr. Hyder:* Do you not enjoy Imperial preference to the extent of two-thirds of a penny through the United Kingdom?—I cannot answer that question; I am not a politician.

27338. It is a matter of your getting hard cash from the United Kingdom?—Personally I am not fond of any protection.

27339. *The Chairman:* Are you familiar with the facts of the case?—I know that Java has to pay a little more import duty than we do.

27340. *Dr. Hyder:* You get 8 pies a lb. and pay 3 pies a lb. here.

27341. *Mr. Calvert:* Could you tell me how much it costs to transport 100 lbs. tea from your garden to Calcutta?— I could not tell you at the moment.

27342. Cannot you say roughly?—I have no idea.*

27343. Could you say what proportion of the total produce in Assam is exported?—I have not got a figure; I can get it for you.†

27344. The incidence of the export duty depends on the proportion of the tea which pays the duty to the total tea produced. Your internal consumption, I gather, is going up very rapidly?—We are doing our best in the way of propaganda. I think we have sold this year only 10 million lbs.

27345. It has gone up from 18 million lbs. to 50 million lbs.?—That is for the whole of India. We are spending a good bit on it. I have no doubt that the consumption of tea will go up because the Indian likes it.

27346. You suggest that one effect of this export duty is that it prevents the Government of Assam from taxing the tea industry for the benefit of the Province?—I said it was a severe handicap. We are so badly handicapped that the Government of Assam cannot get what they deserve to get.

27347. Is it not because the Government of Assam underassessed you originally and therefore left a margin which the Government of India could assess?—No, that is not the case. In the 'nineties' when I came here we could not make any money. I have struggled for 32 years, but to-day I have not got enough to live on.

27348. There must have been a margin somewhere, otherwise the Government of India could not have done it?—During the War there was.

27349. Is it your experience that the moneylender is advancing more money nowadays?—I think the cost of living has gone up but I cannot say if the poor ryot is getting much more for his crop.

27350. Generally speaking, the cost of living has gone up?—The price of rice has gone up and the price of *ghi* and other articles has also gone up. I consider the ryots to-day worse off than they ever have been in my experience.

27351. Is there any mule-breeding here?—No.

27352. Is there any scope for mule-breeding?—I have never tried it.

27353. Your difficulties of transport on account of bad roads would be considerably reduced if there were mule transport?—The elephant is the only animal suitable here and we are not allowed to catch him.

27354. *Rai Bahadur R. M. Das:* On page 211, you say, "Grazing areas are insufficient, badly distributed and the pastures very inferior, frequently consisting of plots of waste land not required for any other purpose." I want to ask if, during the present settlement operations, the ryots should approach the Government and ask for a plot of land to be reserved for forage at a low rate of interest? What do you think of this idea?—I should say that you should treble the grazing grounds. The difficulty is that you want to get hold of the land in a block in each village and no one will give up the land. I have handed over three grazing blocks. The only thing I can say is that this problem of grazing grounds is going to be a very serious one in the future.

27355. You know there are several classes of waste land in Assam. If, in future settlements, Government were to make it a rule that a man having three acres of land for cultivation must set apart one acre for forage, do you think that would be a feasible proposition?—If it could be organised.

27356. Could it be enforced?—I think it would be a very sound policy indeed.

27357. Do you think your *gaonbura* would be able to enforce it and to see that the land set apart for grazing purposes was not used for paddy cultivation or for any other purpose?—It would have to be demarcated

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* *Note by the witness.*—*It is Rs. 2-0-6.*

† *Note by the witness.*—85 per cent of the tea grown in Assam is ultimately exported to the United Kingdom and elsewhere

as Government grazing ground. During the War a lot of grazing land was taken up for sugarcane cultivation. I know of two grounds that were partially spoilt by them.

27358. Do you think your *gaonburas* will be able to prevent such lands being used for other purposes?—I would not trust them very far; you really want travelling Inspectors for animal husbandry to help the ryots.

27359. You think it is desirable?—It is most desirable.

27360. You say that fish culture should be encouraged. You know there is a Department of Fisheries in Assam?—Yes.

27361. Are you aware of the activities of that department?—I do not know much about it.

27362. Do you think that the Department of Fisheries should encourage fish culture by supplying fry to cultivators?—The fry are already there, what happens is that they are destroyed every year; it is no good putting them in the river if someone poisons them.

27363. So, Government should take measures to prevent poisoning?—Yes.

27364. *Sir Henry Lawrence :* You said the coolies spend money on drink. Do they spend all their surplus cash on drink?—No; some drink more, some drink less. They would not have been settled so numerously in this Province if they had spent all their surplus money on drinking.

27365. You do not mean to suggest that drink is a serious evil amongst your tea coolies?—I have known of cases of excess on occasions but it is very difficult to check. Occasionally there are rows on account of drink.

27366. Some particular sections of your coolies drink more?—The best coolie is the biggest drinker. The Santhal coolies are the greatest drinkers and they are the best coolies. In my opinion, drink and work go together. I have had experience for a good many years.

27367. *Dr. Hyder :* Have you got enough post offices on the tea estates?—We generally subsidise our own post offices.

27368. Instead of having these shopkeepers, cannot you organise retail co-operative societies?—Once I put Rs. 100 into a society and I got all my assistants to support it, but it failed and we lost our money.

27369. Have you got any banking facilities by which the coolies can deposit their surplus savings?—I do not think we have. I have heard that they have commenced a bank but they do not always trust the management. They send a lot of money home through the post offices. Rupees 3,000 per week is the remittance through our post office.

27370. Is that from one tea estate?—Yes; I have got four gardens.

27371. *Mr. Hezlett :* Would you as a businessman plant a tea garden on paddy land?—No.

27372. Paddy land is quite distinct from tea land?—Tea land can be made into paddy land by *bunding*, but you cannot make paddy land into tea land. Tea lands want too much slope, for instance. I have known small pieces of paddy land planted with tea but they have not been a success.

27373. *Sir Thomas Middleton :* Do you keep many cattle of your own?—We do; we have about 800 cattle.

27374. What do they cost you?—We cannot get them easily; some come round for sale. The traffic in cattle from Manipur which formerly existed has now been stopped, so they are generally purchased locally. The coolies buy their own cattle and we supply them with grazing grounds.

27375. What is the cost of a small bullock in your district?—The bullocks which are about the size of Manipur bullocks cost about Rs. 70 or Rs. 80 per pair. The price of the smaller ones which the coolies use for cultivation runs from about Rs. 28 to Rs. 35.

27376. Are the larger bullocks suitable for cartage?—No; such animals cost us Rs. 200 per pair; I bought some only last week.

27377. Where do these high-priced animals come from?—They are imported from the North-West.

27378. What kind of grain do you give them when they are in hard work?—We require two grass-cutters for about four pairs of bullocks and then I give them about two seers of *kalai dal* which is something like small peas.

27379. *Prof. Gangulee:* You referred to coolies who cultivate their own land. Do you give any land to permanent coolies?—We give about 300 acres for each garden.

27380. You distribute that area among your permanent labour force?—Yes.

27381. On what basis?—They are supposed to get an acre per family. Frequently when the father dies, the sons get the father's land. But we try to give one acre of paddy land to each household.

27382. Do you take any rent from them?—We charge them one rupee per acre which is a nominal rent.

27383. Is there a toddy or drink shop in every estate?—There are no toddy shops; we do not encourage them in the habit of drinking.

27384. Where do they get their drink from?—They make their own and they also buy some from Government liquor shops. They make rice beer.

27385. *Dr. Hyder:* Is that illicit distillation?—I suppose so (there is no rule against home brew for personal consumption).

(The witness withdrew.)

The Commission then adjourned till 3.30 p.m. on Sunday, the 19th December, 1926.

APPENDIX I.

Efficiency as judged by percentage of daily attendance.

(January to October 1926.)

1926.	Amgoorie.			Borbam.			Hulwating.			Tiphook.		
	MEN.	WOMEN.	CHILDREN.	MEN.	WOMEN.	CHILDREN.	MEN.	WOMEN.	CHILDREN.	MEN.	WOMEN.	CHILDREN.
January	82	59	76	83	63	63	77	70	87	91	81	87
February	78	57	73	86	63	70	77	70	87	90	80	89
March	82	59	75	84	64	70	73	64	79	88	76	84
April	82	55	75	83	62	66	71	72	80	85	72	89
May	86	59	75	83	63	66	70	73	77	86	72	81
June	80	65	76	83	66	67	68	73	78	83	78	79
July	78	65	76	81	68	69	66	66	74	81	72	83
August	69	52	63	76	61	71	54	59	78	74	72	79
September	74	56	71	79	62	72	57	64	76	85	72	86
October	79	59	72	81	65	71	71	72	78	85	76	84
Total ..	790	586	732	819	637	685	684	683	794	848	751	841
Average percentage ..	79	58	73	82	64	68	68	68	79	85	75	84

APPENDIX II.

Average monthly family earnings.

(ONE MAN, ONE WOMAN AND ONE BOY.)

(*January to October* 1926.)

——	Amgoorie.	Borbam.	Hulwating.	Tiphook.
1926.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.
January	23 10 8	28 1 8	28 11 5	24 15 9
February	27 1 11	27 14 10	26 13 8	26 7 10
March	30 15 10	29 12 3	30 0 9	26 14 4
April	29 2 11	28 6 6	32 5 10	28 12 2
May	34 14 1	33 1 7	36 0 8	31 5 1
June	43 13 3	47 12 7	45 5 7	38 6 4
July	40 4 1	42 15 1	47 13 8	30 14 7
August	47 13 2	46 13 11	38 15 1	33 15 3
September	36 13 11	41 15 6	41 6 11	31 4 7
October	31 10 1	33 11 10	24 8 2	26 15 5
Total ..	346 3 11	360 9 9	352 1 9	300 9 4
Average monthly income ..	34 9 11	36 1 0	35 3 5	30 0 10

Mill worker, Sholapur, Bombay—

	RS. A. P.
Average monthly income (family of 4·8 persons)	42 15 2

(*Labour Gazette, Bombay, for August* 1926.)

APPENDIX III.

Cost of living for August 1926 (the most expensive month of the year.)

Daily allowance for one person—

		RS. A. P.	RS. A. P.
Rice	14 Chattaks at Rs. 8 per maund.	0 2 9	
Dal	2 ,, at Rs. 10 ,, ,,	0 0 6	
Potato	2 ,, at 3 annas per seer.	0 0 4	
Salt	1 Chattak at 1 anna ,,	0 0 2	
Mustard oil ..	.. ..	0 0 3	
Spices	.. ..	0 0 3	
	Total ..	0 4 3	Monthly 7 15 6

* *Extra per month* (for man and woman)—

	RS. A. P.		
Kerosene oil	0 6 0		
Tobacco	0 6 0		
Pan	0 8 0	Average per head, monthly	1 2 0
Fish or meat	1 0 0		
	2 4 0		

* *Vide* next page.

* *For man per annum—*

		Rs.	A.	P.		Rs.	A.	P.
4 Dhutis	at Rs. 1-12.	7	0	0				
4 Half coats	at Rs. 1-2.	4	8	0				
1 Blanket	at Rs. 2.	2	0	0				
2 Puggrees	at Re. 1.	2	0	0				
Barber monthly	at As. 3.	2	4	0				
* *For woman—*								
4 Saries	at Rs. 2 14	11	8	0	Average per head, monthly.	1	7	4
4 Jackets	at As. 15	3	12	0				
1 Blanket		2	0	0				
Total		35	0	0				
Average		17	8	0	Total monthly	10	8	10

* Not included in above—	Rs.	A.	P.
Cost of family (infants and dependants). Pooja expenses. Liquor. Opium. Household goods—Pots and pans, etc. — For man, woman and child, say,	25	0	0
Mill worker, Sholapur, Bombay—			
Average monthly cost (family of 4·8 persons).	40	0	11

(*Labour Gazette, Bombay, for August* 1926.)

APPENDIX IV.

Statement of expenditure for recruiting a labourer.

	Rs.	A.
For *Sardar*—		
Cess to the local Government	3	0
Food expenses attending court for registration	0	8
Railway fare and food expenses to Goalundo Depot paid at the garden (not included in bills).	8	6
Indian State's capitation fee on *Sardar*	15	0
Tea District Labour Association capitation fee on *Sardar*.	5	0
For Emigrant—		
Indian State's capitation fee	5	0
Assam Recruiting Protection Board cess	3	0
Tea District Labour Association capitation fee	15	0
Bonus for debts	5	0
Bonus on arrival	5	0
Clothing	12	8
Food on journey	2	8
Forwarding and railway fare	52	0
Sardar's expenses in recruiting districts	50	0
	181	14
Commission to *Sardar* paid at the garden	20	0
Total	201	14

NOTE.—The above figures represent the cost of one *Sardar* recruiting one working adult from Mourbhunj district.

For districts situated farther a-field from the labour districts, the railway fare and food expenses increase with distance.

The average recruitment works out rather below one working coolie for each *Sardar* sent down to the recruiting districts.

Expenditure on recruitment is further increased by—

(*a*) Loss of the recruiting *Sardar's* work to the garden generally a period of 4 to 6 months.

(*b*) *Sardar's* failing to recruit labour.

(*c*) Recruitment of non-working dependents.

(*d*) Repatriation expenses.

Mr. W. G. McKercher]

Sunday, December 19th, 1926.

JORHAT.

PRESENT:

The MARQUESS OF LINLITHGOW, D.L. (*Chairman*).

Sir THOMAS MIDDLETON, K.B.E., C.B.
Sir JAMES MACKENNA, KT., C.I.E., I.C.S.
Mr. H. CALVERT, C.I.E., I.C.S.
Professor N. GANGULEE.
Dr. L. K. HYDER.

Mr. J. HEZLETT, I.C.S.
Rai Bahadur RAMANI MOHAN DAS. } (*Co-opted Members*).

Mr. J. A. MADAN, I.C.S.
Mr. F. W. H. SMITH. } (*Joint Secretaries*).

LUZEKU SEMA, representing the Sema Nagas.

Oral Evidence (Mr. K. Cantlie, I.C.S., interpreted.)

27386. *The Chairman:* Luzeku Sema, the Royal Commission are glad to see you, and we hope you will be ready to answer our questions. By what class of cultivation do you and the people in your village live?—By *jhum* cultivation.

27387. With movement every three years, or how often?—The proper system of *jhum* cultivation should be cultivation after every twelve or fifteen years by two years at a time, but we are forced to do it after three years.

27388. Coming back to the same ground every three years?—Yes.

27389. Cutting out the jungle, two years' cultivation, three years' interval and then returning; is that the position?—Yes.

27390. That is your whole livelihood?—That is the general way in which the Semas gain their livelihood, but in my village they have introduced terrace cultivation, with the assistance of Government.

27391. What has been your experience of that terrace cultivation?—We like the terrace cultivation very much, and it has been of great benefit to us. Both we and other Sema villages would extend it greatly, but the trouble is that we cannot afford to pay the labourers to help us in constructing the terraces.

27392. Do you require advice as to how to construct the terraces?—There are two Sema instructors employed by Government to teach terrace cultivation. They teach about six Sema villages. We would like to have more instructors from Government.

27393. Are these terrace lands irrigated?—They are irrigated by the digging of ditches.

27394. Where does the water come from?—It is taken from the hill streams.

27395. Are they dammed for the purpose?—Yes.

27396. Do you require skilled advice in the matter of these minor irrigation schemes?—Yes, skilled advice is necessary for their construction.

27397. You referred to the necessity for hiring labour. Is it not within the capacity of the villages concerned to provide the necessary labour?—The Government pays us 2 annas daily for each labourer, but we have to pay 4 annas daily and provide them with their food in addition. All the people of a village will not join together to cultivate; each man will cultivate his own particular piece of the terrace, and each man pays for the labour to assist him at the rate of 4 annas and food. We only get 2 annas from Government, and that is the cause of the trouble.

27398. It is your view that the village itself, without outside assistance, is not capable of providing the necessary labour?—Without outside help the villages are not able to adopt terrace cultivation, as each man is too poor to engage outside help and the labour required to make the terraces is too vast for one man to undertake alone.

27399. If sufficient terrace land could be provided, would the villagers forego *jhum* cultivation altogether?—If there were sufficient terraces it would not be necessary to *jhum* for rice, but for Job's tears and various kinds of millet we would still retain our *jhum*.

27400. There is no likelihood of your doing without *jhum* altogether provided sufficient land were under controlled cultivation?—Millet does not grow well under irrigated cultivation, owing to there being too much water.

27401. If you had cleared unirrigated land, could not you cultivate it year by year, as other people do?—We have no flat land in the hills; it is all on a slope, and it is not like the land in the plains. The land is stony and the soil is poor, so that we could not produce crops on it year by year. We do not use manure, except wood-ash, for the *jhum* cultivation, nor do we use manure for the terrace cultivation. The Angamis, on the other hand, do use manure.

27402. Do you use manure of any sort?—No. We do not burn our rice stubble, but hoe it in; that is all.

27403. Do your people borrow money?—Yes. There is a lot of borrowing and lending in the Sema villages, and the poor men are greatly in debt.

27404. Is most of their trading carried on on a money basis, or by exchange and barter?—The use of money is general nowadays; if a man buys pigs or cattle he pays money for them.

27405. What are your principal crops?—Rice, Job's tears, two kinds of millet and sesamum.

27406. Any chillies?—Yes.

27407. Do you grow the potato?—The Angamis grow potatoes, but we do not. We also grow onions and various other vegetables and gourds.

27408. Why do you not grow potatoes?—We do not know how to do it.

27409. Would you like to learn how to do it?—The Angamis, who grow potatoes, say it is a very troublesome and risky crop, requiring a great deal of manure and labour.

27410. But the Angamis go on growing it, in spite of these difficulties?—Yes, in certain villages.

27411. Do your people get much food out of the jungle in the way of wild fruits, roots and the like?—We get arum and other roots, yes.

27412. Are there any other matters about which you would like to tell the Commission?—We want this kindness from the Commission. Nowadays the Government forbids us to take heads and kill one another, and our numbers have become larger, so that we have not enough to eat. By extending terrace cultivation, we could get sufficient food to live. We would ask the Commission to help us to extend it. That is all we ask.

27413. *Sir Thomas Middleton:* Is rice grown on the *panikhot* as productive as rice grown after *jhuming*?—The terrace cultivation rice is better than the *jhum* rice.

27414. For how many years have you known terrace rice?—Ever since I was a small boy, twenty years ago.

27415. Are the crops of rice as good on these fields *now* as they were when you were a small boy?—We have found that on some plots where the rice has been sown year after year it deteriorates, but we hoe the land well and this seems to provide a remedy.

27416. Have you any cattle?—We do not, as a tribe, drink milk, but we keep cattle, cows, pigs, fowls and *mithans*.

27417. Do you collect the manure of your animals for your rice fields?—We collect it, put it outside the village and let it stay there; we make no use of it.

27418. Not even for millets?—No.

27419. Why do you make no use of it? The plains people do?—Our neighbours the Angamis use manure, but they keep cowherds who go after the cattle and pick up the manure for use on the fields. We do not keep cowherds, so we lose the droppings of the animals in the jungle.

27420. You do recognise it is a loss?—We do not know enough about it to be able to say whether manure is good.

27421. With regard to the cultivation of millets and Job's tears, the former practice was to *jhum* after about twenty years, but now you have got down to *jhuming* after three years. What is the result of that shortened period on the millets?—The result of cultivating again after three years is that the millet is short in the stem and the seed is small. Moreover, the quantity of the seed is less.

27422. Is it as easy to prepare the soil properly for sowing after three years' *jhuming* as it is after twenty years?—It is much easier, because there are not so many trees; but the product is much less.

27423. Does the seed often fail after the three years' *jhuming*?—Yes, it sometimes fails entirely.

27424. Is that dying off more likely to occur after the three years' than after the twenty years' *jhuming*?—Yes. After three years it sometimes fails entirely, whereas with twenty years it does not.

27425. You yourselves do not drink any milk, but do you give milk to your children?—No.

27426. For how long do the mothers nurse the children?—From a year to eighteen months.

27427. After that, what food do you give the children?—They eat rice and *naga dal* and sometimes chickens.

27428. Is the rice semi-digested for them by the mother by chewing?—Yes, the mothers chew the rice and give it to the children.

27429. For how long does that go on?—For about eight months. The day after birth they get a little rice.

27430. *Dr. Hyder:* You complain of shortage of labour. Cannot your women help you in the construction of these *bunds* and in your cultivation generally?—There are difficulties in the way on account of tribal customs. After the land has once been cut for *jhum*, the women prepare the land the second year for the *jhum* while the men cut fresh land. The women do help the men in agriculture, but making *panikhot* is very hard work and would be considered improper for women.

27431. Since the *Sarkar* stopped head-hunting, is infanticide practised to keep down your numbers?—I do not know of any practice of infanticide amongst the Semas.

27432. What objection have you to coming down to the plains and working in the tea gardens?—Many of us come down every year to work in the tea gardens in cutting jungle, but we do not do hoeing; that is not our custom.

27433. To what is your indebtedness due?—If a poor man has not enough land, or his crop is poor and he does not get enough to eat, if the rich men did not lend him some money, how would he live?

27434. What is the price of a bride?—Amongst the Semas it is a *mithan*, which is an *enormous* ox. It used to be worth Rs. 40, but now we have to pay Rs. 100 to Rs 150 as the price of a bride. The Aos give a pig for the bride; the Lhotas give up to Rs. 200.

27435. *Mr. Hezlett:* How many Sema villages have actually taken up terrace cultivation?—Six.

27436. Is the cultivation gradually extending every year?—Yes, it extends somewhat every year.

27437. *Sir James MacKenna:* If Government gave 4 annas per labourer per day, would the practice of terracing extend?—If the Government gave 6 annas a day, I am certain it would greatly extend, but even 4 annas should relieve the situation. The labourers eat four times a day when they are at work, which makes it very expensive for their employers.

27438. What is the crop most frequently encountered in *jhumed* areas?—Our staple food is rice, so it is mostly rice.

(The Interpreter: I think it varies according to the altitude of the different villages; some of the land in high cold places cannot grow rice at all.) We make beer from millets.

27439. Do you export any of your produce?—The Semas are not traders.

27440. *Prof. Gangulee:* Do you weave your own clothes?—Yes. We do not know how to spin properly, so we buy the thread; but we do the weaving.

27441. Where do you buy the yarn?—From the Angamis and Aos.

27442. Do you grow any cotton?—No. The neighbouring tribe of Lhotas do, but we do not.

27443. Do you weave your own blankets?—Those who have gone to do coolie labour anywhere like to purchase a blanket, and they are the people who have blankets. Other people do without; they use their own cloths.

27444. When you have dealings with neighbouring tribes, what is your means of exchange barter?—The villagers across but near the frontier will take money, but those further away do not understand money; some of them on getting a rupee, make a hole in it and wear it round their necks.

27445. *Mr. Calvert:* With regard to debt, who lends the money?—I and my father are chiefs, and we lend money to our men in the villages when they need it.

27446. If a borrower defaults in repayment, what do you do?—If a man dies, his son will take over the burden.

(The Interpreter: Not very long ago they used to take the borrower as a slave. I do not think the practice lingers now, but in the old days a man would sell himself to work for the money-lender.)

27447. *Rai Bahadur R. M. Das:* Are there any schools in your villages?—In the Angami country, there are several schools, including a middle English school and Missionary schools. In the Sema country, there is one school, which has been open for six years, and there we learn the Sema language.

27448. Would you like to educate your children?—Though I am married, I have no children.

27449. Would your relatives like to?—Some boys would like to learn when they are young, and the parents are quite ready to give them education, but during the years of education they have to feed them without getting any return from them, so that people are not very keen about it.

27450. Is education in the Government and Missionary schools given free?—I am not sure. In Missionary schools, there are no fees, but the boys have to work. I do not know about the Government schools. In the middle English school, I believe they take fees but not in the village schools.

27451. *The Chairman:* Do many of the young men of your tribe go over the border in these days?—Yes, the young men do go.

27452. With what object?—There are generally wars with different villages in progress, so that sometimes we go to a particular place and sometimes we do not.

(The witness withdrew.)

(The Commission then dispersed for the Christmas holidays and resumed its sittings at Dacca on the 5th January, 1927. For evidence at Dacca see Volume IV.)

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GLOSSARY

Agar	An essential oil of the 'Agar' tree (*Aquilaria agallocha*).
Aratdar	Seller of commodities on behalf of the growers and of middlemen with godowns for hire for storage of goods.
Arhar	A variety of pulse (*Cajanus indicus*).
Aus (paddy)	Summer paddy, generally sown on high lands.
Bao	Paddy which is sown broadcast in April on land which is flooded in the rains; reaped in December.
Bhadralog	Gentlemen.
Bidha	A form of harrow.
Bigha	One-third of an acre.
Bhil (bil)	Depression more or less permanently covered with water.
Boro (paddy)	A variety of rice transplanted in January from nurseries and harvested in March; sometimes called spring paddy.
Bund	Dam.
Chamars	Workers in leather, one of the depressed classes.
Chowkidar	A watchman.
Chowkidaripanchayats.	Associations for keeping watch and ward in villages.
Chur (char)	Land newly formed by water-borne silt.
Dal	A generic term for food pulses.
Dhenki	Thrashing instrument.
Dhoti	The loin cloth worn by men.
Faria	A small dealer.
Gaonbura	Village headman (Assamese).
Goalas (Gowalas) ..	Milkmen.
Gur	Unrefined Indian sugar.
Hat	A market place where local producers and consumers as well as traders meet once or twice a week for sale and purchase.
Howdah elephant ..	A trained riding elephant.
Jhuming	Temporary cultivation in jungle clearings.
Kakia bombai	A variety of jute.
Khal	A water-course.
Khas mahals	Lands under the direct control of Government and let out by them to tenants direct.
Khesari	A kind of pulse (dal) (*Lathyrus sativus*).
Kurkani	Badly broken and very uneven (used of land).
Kutcha	Literally 'not solid.' Used of temporary structures, roads of poor quality, etc. (opposite term is 'pucca').
Kutcheri	The office of a Government official.
Kyah	Marwari (a class of merchants and traders coming from Marwar).

Mahajan	A merchant, used to indicate moneylenders also.
Mahout	A man in charge of an elephant.
Mandal	Village accountant or registrar.
Masur (i)	A kind of pulse (*Lens esculenta*).
Matikalai	A kind of pulse (*Phaseolus mungo*).
Mauzadar	Revenue collector for a group of villages (mauza).
Mithan	Indigenous wild or semi-wild cattle.
Namaz	Mahommedan prayers.
Pam system	The system of small areas of cultivation at a distance from the village.
Pargana	Revenue sub-division of a tahsil.
Patwari (*see* Mandal).	
Pundit	Teacher.
Pura (Poorah)	Equivalent to about 4 bighas or 1⅓ acres
Rabi	Winter-sown (crops).
Sardar (Sardari system).	A man licensed to recruit labour for plantations.
Shikar	Sport.
Sital pati	Fine matting made from the bark of *Clinogyne dichotoma*.
Taccavi	Advances made by Government to cultivators for agricultural purposes.
Tahsil	A local revenue division.
Tahsildar	The subordinate officer who is in charge of such a division.
Thana	Police station, also the area comprised in it.

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